

OPERATOR'S MANUAL

4-7 Liters (EDC 4)

**VOLVO
PENTA**

ENG

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GER

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SWE

Denna instruktionsbok kan beställas via internet på ett annat språk gratis i upp till 12 månader efter leverans.

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DUT

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FIN

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POR

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Se não for possível aceder à internet, contacte o seu concessionário Volvo Penta.

GRE

Το παρόν Βιβλίο Χρήσης μπορεί να παραγγελθεί δωρεάν σε άλλη γλώσσα μέχρι 12 μήνες μετά την παράδοση, μέσω διαδικτύου.

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Εάν δεν είναι δυνατή η πρόσβαση στο ιαδίκτυο, παρακαλούμε επικοινωνήστε με το δικό σας αντιπρόσωπο της Volvo Penta.

RUS

Данное руководство по эксплуатации можно бесплатно заказать на другом языке по Интернету в течение 12 месяцев после доставки.

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TUR

Bu Kullanım Kılavuzu, teslimden 12 ay sonrasına kadar Internet yoluyla ücretsiz olarak farklı bir dilde sipariş edilebilir.

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İnternet mümkün değilse, lütfen Volvo Penta yetkili satıcınızla temas geçin.

CHI

本操作手册可通过互联网以不同的言进行订购，交付后可免费使用达12个月。

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如果无法访问互联网，请与沃尔沃遍达经销商联系。

BRA

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JPN

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CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust, some of its constituents, and a broad range of engine parts are known to the State of California to cause cancer, birth defects, and other reproductive harm. Additionally, lubricants, fuels, and other fluids used in engines—including any waste created through the wearing of engine parts—contain or produce chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Battery posts, terminals, and related accessories contain lead and lead compounds. Wash your hands after handling. Used engine oil contains chemicals that have caused cancer in laboratory animals. Always protect your skin by washing thoroughly with soap and water.

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Foreword

Volvo Penta engines are used all over the world. They are used in all possible operating conditions. This is not a coincidence. After 100 years as an engine manufacturer the Volvo Penta name has become a symbol of reliability, technical innovation, top of the range performance and long service life. We also believe that this is what you demand and expect of your Volvo Penta engine.

We would like you to read this operator's manual thoroughly and consider the advice we give on running and maintenance. Please pay attention to the safety instructions contained in the manual.

As owner of a Volvo Penta engine, we would also like to welcome you to a worldwide network of dealers and service workshops to assist you with technical advice, service requirements and replacement parts. Please contact your nearest authorized Volvo Penta dealer for assistance.

You will find your closest dealer at our home page on the Internet www.volvopenta.com - amongst other useful information about your Volvo Penta engine - we invite you to visit!

Safety Information

Read the Operators Manual through very carefully before you start the engine or do any maintenance or service. It has to do with your safety, an incorrect operation can lead to personal injury and damage to products or property. This chapter describes how safety precaution is presented in the Operators Manual and on the product. It also gives you an introduction to the basic safety rules for using and looking after the engine. If there is still something which is unclear or if you feel unsure about it, please contact your Volvo Penta dealer for assistance.

NOTICE! Check that you have received the correct operator's manual before you read on. If not, please contact your Volvo Penta dealer.



This symbol is used in the Operators Manual and on the product, to call your attention to the fact that this is safety information. Always read such information very carefully.

Safety texts in the Operators Manual have the following order of priority:



DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING!

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



CAUTION!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

IMPORTANT!

Indicates a situation which, if not avoided, could result in property damage.

NOTICE! Used to draw your attention to important information that will facilitate the work or operation in progress.



This symbol is used on our products in some cases and refers to important information in the Operators Manual. Make sure that warning and information symbols on the engine are clearly visible and legible. Replace symbols which have been damaged or painted over.

Safety rules for operation and maintenance

Daily checks

Make it a habit to give the engine and engine bay a visual check before starting (**before the engine is started**) and after operation (**once the engine has stopped**). This helps you to quickly discover whether any leakage of fuel, coolant, oil or any other abnormal event has happened, or is about to happen.

Carbon monoxide poisoning

Only start the engine in a well ventilated area. When operated in a confined space, exhaust fumes and crankcase gases must be ventilated.

Cooling System

Avoid opening the coolant filling cap when the engine is hot. Steam or hot coolant can spray out and cause scalding, at the same time as the pressure built up is lost.

If the filler cap, coolant hose etc., still has to be opened or removed when the engine is hot, undo the filler cap slowly and carefully, to let the pressure out before removing the filler cap completely and starting work. Note that the coolant can still be hot and cause scalding.

Fuel and lubrication oils

Always protect your hands when searching for leaks. Fluids which leak under pressure can force their way into body tissue and cause severe injury. There is a risk of blood poisoning (septicemia).

Only use the fuel recommended in the Operators Manual. The wrong grade of fuel can cause malfunctions or stop the engine. In a diesel engine, it can also cause the injection pump to seize and the engine will over-rev, entailing a strong risk of personal injury and machinery damage.

Always cover the alternator if it is located beneath the fuel filters. Fuel spillage can damage the alternator. Always change the oil, oil filter and fuel filter at the specified intervals.

Starting lock

If the instrument panel does not have a key switch, the engine room must be lockable, to prevent unauthorized persons from starting the engine. Alternatively, a lockable main switch can be used.

Hot surfaces and fluids

A hot engine always increases the risk for burns. Be on your guard against hot surfaces: the exhaust manifold, turbocharger, oil pan, charge air pipe, starting heater, hot coolant and hot lubricating oil in pipes, hoses etc.

Fuel filling

There is always a risk of fire and explosion during fuel filling. Smoking is forbidden, and the engine should be stopped.

Never overfill the tank. Shut the tank cap securely.

Only use the fuel recommended in the instruction book. The wrong grade of fuel can cause serious malfunctions, power loss or stop the engine.

Operation

The engine must not be operated in environments which contain explosive media since none of the electrical and mechanical components are explosion proof.

Going close to a running engine is a safety risk. Hair, fingers, loose clothes, or dropped tools can catch on rotating components and cause severe injury.

When engines are supplied without touch guards, all rotating components and hot surfaces must be protected after installation in their application, if necessary for personal safety.

Care and maintenance

Knowledge

The Operators Manual contains instructions for doing the most common service and maintenance tasks in a safe and correct manner. Read them carefully before starting work.

Literature for more major tasks is available from your Volvo Penta dealer.

Never do a job if you are not entirely sure about how to do it. Please contact your Volvo Penta dealer and ask for assistance instead.

Stopping the engine

Stop the engine before opening or removing the engine hatch/hood. Service and maintenance work should be done with the engine stopped unless otherwise specified.

Prevent the engine from being started by pulling out the starter key and disconnect the power with the main switch. Lock them in the "Off" position.

If the instrument panel does not have a key switch, remove the system voltage with the main switch.

Fix a notice by the operator position to say that work is in progress.

Working with, or approaching a running engine is a safety risk. Hair, fingers, loose clothes, or dropped tools can catch on rotating components and cause severe injury. Volvo Penta recommends that all service work which requires the engine to be running should be done by an authorized Volvo Penta workshop.

Fire and explosion

Fuel and lubrication oil

All fuel, most lubricants and many chemicals are flammable. Always read and observe the advice on the packages.

Work on the fuel system must be done with the engine cold. Fuel leakage and spills on hot surfaces or electrical components can cause fires.

Store oil and fuel soaked rags and other flammable material in a fireproof manner. Oil soaked rags can self-ignite in certain circumstances.

Never smoke when filling fuel, lubrication oil or when close to fuel filling stations or the engine bay.

Spare parts

Components in fuel systems and electrical systems on Volvo Penta engines are designed and manufactured to minimize the risk of explosions and fire, in accordance with applicable legal requirements.

The use of spare parts not approved by Volvo Penta can cause an explosion or fire.

Before starting

Re-install all guards which have been removed during service work, before re-starting the engine. Make sure that there are no tools or other objects left behind on the engine.

Never start a turbocharged engine without the air filter in place. The rotating compressor turbine in the turbocharger can cause severe injury. There is also a risk that foreign bodies could be sucked in and cause damage to the machinery.

Lifting the engine

The lifting eyes fitted on the engine should be used for lifting. Always check that the lifting devices are in good condition and that they have the correct capacity for the lift (engine weight together with auxiliaries, if fitted). The engine should be lifted with an adjustable lifting boom for safe handling. All chains or cables should be parallel to each other and should be as square as possible to the top of the engine. Please note that auxiliary equipment installed on the engine could change its center of gravity. Special lifting devices may then be needed to obtain the correct balance and safe handling. Never carry out work on an engine that is **only** suspended in a hoist.

Batteries

Batteries contain and give off an explosive gas, especially when charged. This gas is very flammable and highly explosive.

Smoking, open flames or sparks must never occur in or near to batteries or the battery locker.

Incorrect connection of a battery cable or start cable can cause a spark which can be sufficient, in its turn, to make the battery explode.

Start spray

Never use start spray or similar preparations to help in starting an engine with air pre-heating (glow plugs / starting heater). They may cause an explosion in the inlet manifold. Danger of personal injury.

Electrical System

Disconnect the power

Before any work is done on the electrical system, the engine must be stopped and the power removed by switching off the main switch(es). Any external power supply for engine heaters, battery chargers or other auxiliary equipment connected to the engine must be disconnected.

Electric welding

Remove the positive and negative cables from the batteries.

Then disconnect all cables connected to the alternator. Disconnect both connectors from the engine control module.

Always connect the welder earth clamp to the component to be welded, and as close as possible to the weld site. The clamp must never be connected to the engine or in such a way that current can pass through a bearing.

When welding is completed: Always connect the cables to the alternator **and engine control unit connector before** reconnecting the battery cables.

Batteries

Batteries contain a highly corrosive electrolyte. Protect your eyes, skin and clothes during charging and other handling of batteries. Always use protective goggles and gloves.

If acid comes into contact with your skin, wash at once with soap and a lot of water.

If you get battery acid in your eyes, flush at once with a lot of cold water, and get medical assistance at once.

Introduction

The Operator's Manual contains the information required for the correct, safe operation and maintenance of your Volvo Penta engine. We recommend therefore that you read the manual carefully and learn to handle the engine and other equipment in a safe manner before starting the engine.

The Operator's Manual describes the engine and equipment sold by Volvo Penta. The specifications, design information and illustrations used in the Operator's Manual are not definitive. We reserve the right to make changes without prior notice.

Differences in appearance and function of the controls and instruments may occur in certain variants. In such cases, refer to the Operator's Manuals for the applications concerned.

When ordering service or spares, always specify the engine and transmission identification number. Refer to *Technical Data* page 53.

Warranty

Your new Volvo Penta industrial engine is covered by a limited warranty, according to the conditions and instructions compiled in the Warranty and Service book.

Note that AB Volvo Penta's liability is limited to that which is described in the Warranty and Service Book. Read it carefully, as soon as possible after delivery. It contains important information about the warranty card, service intervals and maintenance that the owner must be aware of, check and perform, otherwise AB Volvo Penta may disclaim its warranty obligations in part or in full.

Contact your Volvo Penta dealer if you have not received a Warranty and Service book, or a customer copy of the warranty card.

Breaking in

The engine must be broken in during its first 10 operating hours, as follows:

Run the engine in normal operations. However, full load may not be applied other than for short periods. Never run the engine for long stretches at constant speeds during this period.

Higher oil consumption is normal during the first 100-200 hours of operation. For this reason, check the oil level more frequently than the normal recommendation.

When an disengageable clutch is installed, it should be checked more carefully during the first days.

Adjustments may be necessary to compensate bedding-in of the friction plates.

Maintenance and replacement parts

Volvo Penta engines are designed for maximum reliability and long life. They are not only built to withstand a demanding environment, but also to have the smallest possible environmental impact. These qualities will be maintained through regular servicing and the use of genuine Volvo Penta replacement parts or replacement parts approved by Volvo Penta.

Volvo Penta has a world-wide network of authorized dealers. They are Volvo Penta product specialists, and have the accessories, genuine parts, test equipment and special tools needed for high quality service and repair work.

Always observe the maintenance intervals in the manual, and remember to note the engine/transmission identification number when you order service and spare parts.

Fuel, oils and coolant

Only use fuel and oils of the grades recommended in the Operator's Manual. Other grades may cause operational malfunctions, increased fuel consumption and over time even shorten the life of the engine. Always change the oil, oil filter and fuel filter at the specified intervals.

Future warranty claims related to the engine and accessories may be declined if an unsuitable coolant has been used, or if the instructions for coolant mixture have not been followed.

Environmental care

All of us like to live in a clean, healthy environment, where we can breathe clean air, see healthy trees, have clean water in lakes and seas, and enjoy sunlight without fearing for our health. Unfortunately, this cannot be taken for granted these days but it is something we all must work to achieve.

Volvo Penta has special responsibility as an engine manufacturer, and for this reason environmental care is a natural cornerstone of our product development. Volvo Penta currently has a broad engine program in which great progress has been made in reducing exhaust emissions, fuel consumption and engine noise etc.

We hope that you will be keen to preserve these qualities. Always follow the directions in the Operator's Manual about fuel grades, operation and maintenance, to avoid unnecessary environmental effects. Contact your Volvo Penta dealer if you notice any changes such as increased fuel consumption or increased exhaust smoke.

Remember always to hand in environmentally hazardous waste such as drained oil, coolant, old batteries, etc. for treatment at a recycling facility.

Our united efforts can make a valuable contribution to the environment.

Certified engines

If you own an emission-certified engine used in an area where exhaust emissions are regulated by law, it is important to be aware of the following:

Certification means that an engine type has been checked and approved by the relevant authority. The engine manufacturer guarantees that all engines of the same type conforms to the certified engine.

This places special demands on the care and maintenance you provide your engine in that

- the maintenance and service intervals recommended by Volvo Penta must be complied with.
- Only genuine Volvo Penta replacement parts may be used.
- Service on injection pumps, pump settings and injectors must always be carried out by an authorized Volvo Penta workshop.
- The engine must not be converted or modified, except with accessories and service kits that Volvo Penta has developed for the engine.
- No installation changes to the exhaust pipe and engine air inlet ducts may be made.
- Any warranty seals may be broken only by authorized persons.

The general instructions in the Operator's Manual concerning operation, service and maintenance apply.

NOTICE! Late or inadequate maintenance/service or the use of spare parts not approved by Volvo Penta will invalidate AB Volvo Penta's responsibility for the engine specification being in accordance with the certificated variant.

Damages and/or costs arising from this will not be compensated by Volvo Penta.

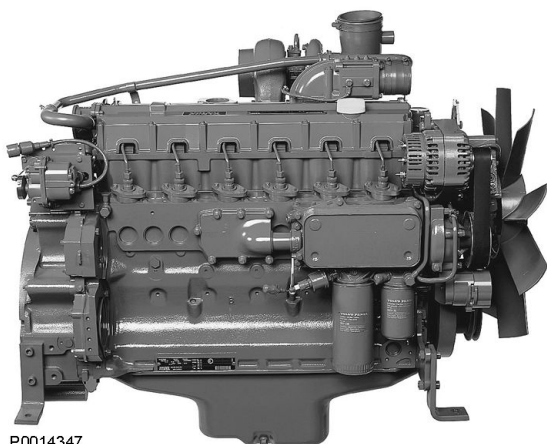
Presentation

This Operator's Manual contains operations and maintenance instructions for the following industrial engines:
TD520GE, TAD530/531/32GE. 4 cylinder.

TAD620VE, TD720GE, TAD720/21/22VE och TAD730/731/32/33GE. 6 cylinder.

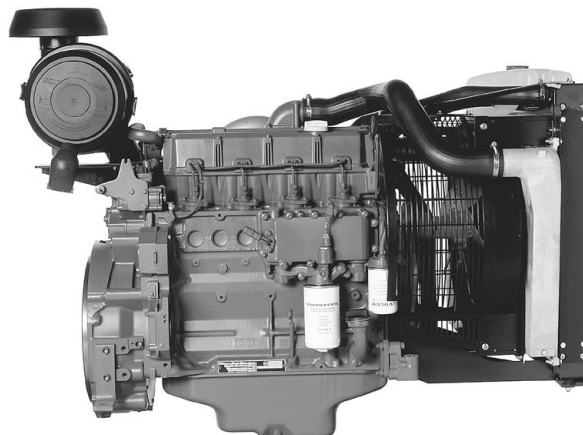
The engines are direct injection in-line 4 and 6-cylinder diesel engines equipped with electronically controlled fuel management (EDC 4), turbocharger, thermostatically controlled cooling systems and electronic speed control. All TAD engines are also fitted with charge air coolers.

TAD620VE



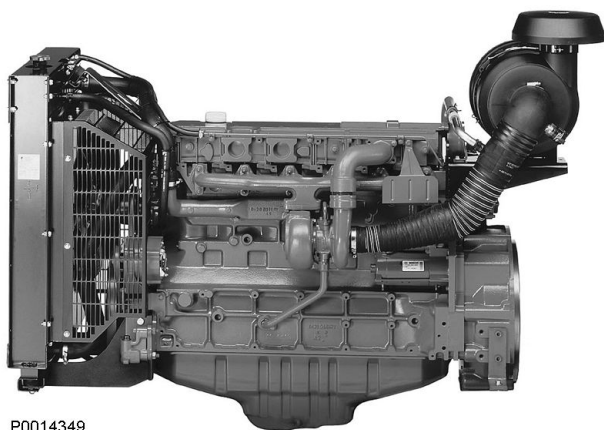
P0014347

TD520GE, TAD530GE, TAD531GE, TAD532GE



P0014348

**TD720GE, TAD730/731/732/733GE,
TAD720/21/22VE**



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EDC 4 (Electronic Diesel Control)

EDC 4 (Electronic Diesel Control) is an electronic system with CAN (Controller Area Network) or potentiometer communications for diesel engine control. The system includes fuel management and diagnostic functions.

Overview

The system includes sensors, control unit and an engine speed regulator. The sensors send input signals to the control unit, which in turn governs the injection pump control rack by means of an actuator in the engine speed regulator.

Input signals

The control unit receives input signals about engine operating conditions from the following components:

- 1 rpm sensor, camshaft
- 2 coolant temperature sensor
- 3 charge pressure sensor
- 4 oil pressure sensor
- 5 fuel temperature sensor
- 6 coolant level sensor (the function is implemented in the control unit as standard, but no sensor is supplied with the engine as a standard feature)

Output signals

The control module uses the input signals to control the following components:

- 1 engine speed regulator (with position sensor for the control rack and actuator)
- 2 electric air preheating (option)

Information from the sensors provides exact information about current operation conditions and allows the processor to calculate the correct fuel volume, check engine status etc.

Diagnostics function

The task of the diagnostics function is to detect and localize any malfunctions in the EDC 4 system, to protect the engine and to ensure operation in the event of serious malfunction.

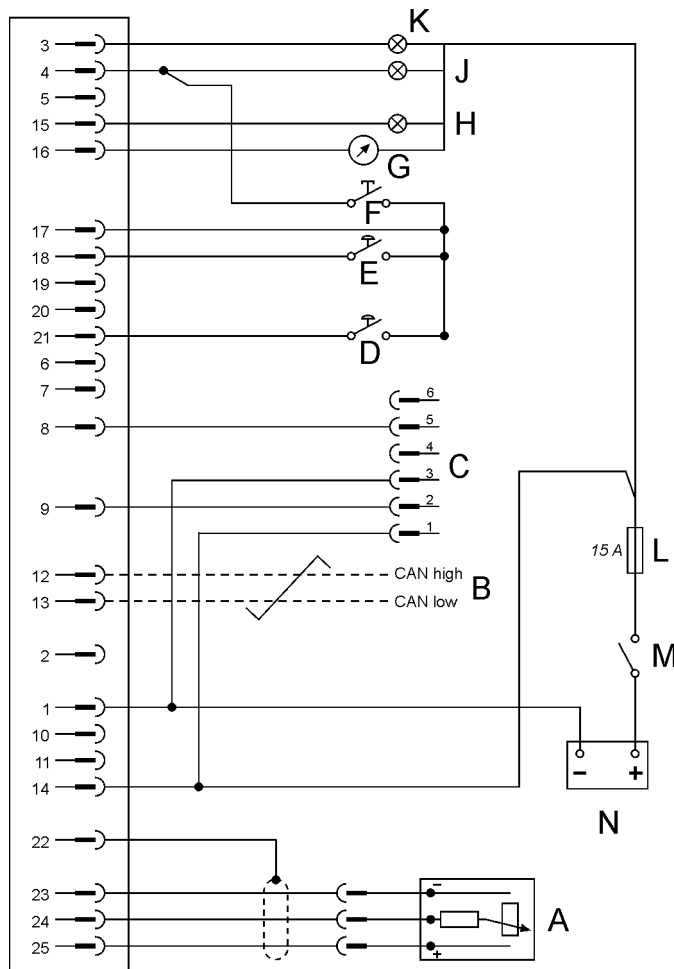
If a malfunction is detected, notification is made either by the diagnostic function, by warning lamps or via the CAN network. Pressing the diagnostic button will provide the operator with a fault code for guidance in any fault-tracing. Fault codes can also be read off via the CAN interface or using the Volvo VODIA tool (including Penta EDC 4 software) at an authorized Volvo Penta workshop.

If there is a serious malfunction, the engine is shut down altogether. Here too, fault codes can be flashed out via the diagnostics connector, the CAN interface or with the Volvo VODIA tool (including the Penta EDC4 software) at an authorized Volvo Penta workshop.

Instruments and Controls

Gauges

The engines are not supplied with instruments and controls. The choice of instruments and controls is up to the customer. Below is a description of the functions available.



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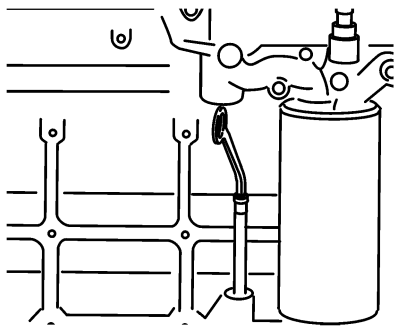
- A. Rpm-potentiometer (Throttle control)
- B. CAN interface SAE J 1939
- C. VODIA input
- D. Droop switch
- E. 1500/1800 switch
- F. Diagnostics button
- G. Tachometer
- H. Warning lamp, oil pressure
- J. Diagnostics lamp
- K. Warning lamp, coolant temperature
- L. Fuse 15A
- M. Main switch
- N. Battery (orange indication) (24/12 V)

Starting

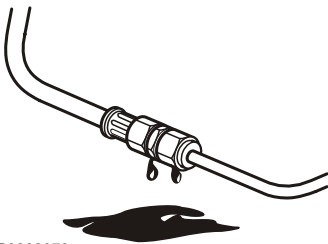
Make it a habit of giving the engine and engine room a visual check before starting. This will help you to discover quickly if anything abnormal has happened, or is about to happen.
Also check that instruments and warning displays show normal values after you have started the engine.

WARNING!

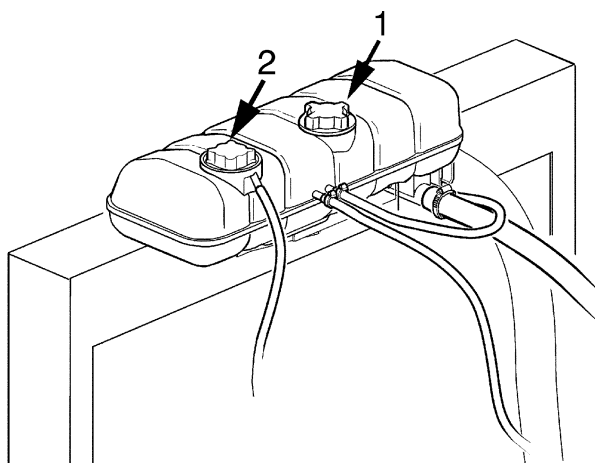
Never use start spray or similar agents to start an engine. This may cause an explosion in the inlet manifold.
Danger of personal injury.



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P0002078



P0004023

Before Starting

- Check that the oil level is between the MIN and MAX marks. Refer to the “Maintenance, lubrication system” chapter.
- Open the fuel taps.

- Check that no oil, fuel or coolant leaks are present.
- Check the air filter pressure drop indicator. Refer to the “Maintenance, Engine, general” chapter:

- Check the coolant level and that the radiator is not clogged externally. Refer to the “Maintenance, cooling system” chapter:

WARNING!

Do not open the expansion tank cap when the engine is hot. Steam or hot fluid may spray out.

- Switch on the main electrical power.
IMPORTANT!
Never disconnect power with the main switch(es) when the engine is running. This can damage the alternator.
- Set the engine speed control to idle, and disengage the clutch/gearbox.

Starting the Engine

The engine control lever must always be in neutral before starting. The EDC 4 system makes sure the engine receives the correct amount of fuel **even during cold starts**.

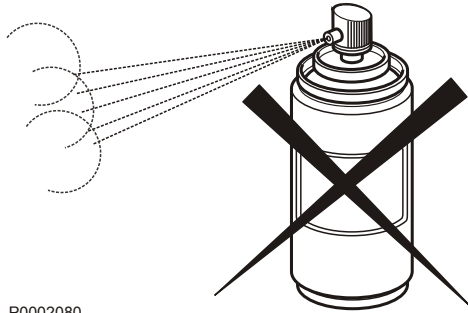
Start the engine.

Adapt the preheating period to suit engine temperature if the engine is fitted with preheating.

Starting in Extreme Cold

Certain preparations must be made to facilitate engine starting, and in some cases to make starting possible at all:

- Use a winter grade fuel (of a well-known make) which has been approved for the relevant temperature. This reduces the risk of wax deposits in the fuel system. At extremely low temperatures, the use of a fuel heater is recommended.
- For fully acceptable lubrication, a synthetic engine oil of recommended viscosity for the relevant temperature should be used. Please refer to the *Maintenance, lubrication system* chapter. Synthetic lubricants are able to manage a wider temperature range than mineral-based lubricants.
- Pre-heat the coolant with a separately installed electric engine heater. In extreme cases, a diesel-burning engine heater may be needed. Ask your Volvo Penta dealer for advice.
- Make sure that the cooling system is filled with a glycol mixture. Please refer to the *Maintenance, cooling system* chapter.
- The batteries should be in good condition. Cold weather reduces battery capacity. Increased battery capacity may be necessary.



P0002080

Never Use Start Spray

WARNING!

Never use start spray or similar agents to start an engine. This may cause an explosion in the inlet manifold. Danger of personal injury.

Starting Using Auxiliary Batteries

WARNING!

Explosion hazard. Batteries contain and give off an explosive gas which is highly flammable and explosive. A short circuit, open flame or spark could cause a violent explosion. Ventilate well.

- 1 Check that the auxiliary batteries are connected (series or parallel) so that the rated voltage corresponds to the engine system voltage.
- 2 First connect the red (+) jumper cable to the auxiliary battery, then to the flat battery. Then connect the black (-) jumper cable to the auxiliary battery and to a location that is **somewhere away from the discharged battery**, e.g. the main switch negative terminal or the negative terminal on the starter motor.
- 3 Start the engine.

WARNING!

Do not touch the connections during the start attempt: Risk of arcing.

Do not bend over any of the batteries either.

- 4 Remove the cables in the reverse order.

IMPORTANT!

The ordinary cables to the standard batteries must not be loosened on any condition.

Operation

Correct operating technique is very important for both fuel economy and engine life. Always let the engine warm up to normal operating temperature before operating at full power. Avoid sudden throttle openings and operation at high engine rpm.

Reading the Instruments

Check all instruments directly after starting, and then regularly during operation.

NOTICE! On engines in continuous operation, the lubrication oil level must be checked at least every 24 hours. Refer to *Oil level, checking and topping up*.

Alarms

Fault indication

If the EDC 4 system receives abnormal signals from the engine the diagnostics lamp will flash. A fault code for guidance in fault tracing is obtained by pressing the diagnostics button (alternatively, the fault code can be obtained via CAN).

More information about fault codes and fault tracing is found in the "Diagnostic function" chapter.

Effect on engine

The diagnostic function affects the engine in the following ways:

- 1 The diagnostic function has discovered a minor malfunction which does not damage the engine.
Reaction: The engine is not affected. The diagnostic lamp lights up.
- 2 The diagnosis function has detected a serious malfunction that will not cause the engine immediate damage (such as high coolant temperature):
Reaction: The engine goes into emergency (limp home) mode. The diagnostic lamp lights up.
- 3 The diagnostic function has discovered a serious malfunction which makes it impossible to control the engine.
- 4 **Reaction:** The diagnostic lamp flashes. The engine is shut down.

Maneuvering

Speed Control

Avoid sudden, extreme throttle inputs.

Operation at low load

Avoid long-term operation at idle or at low load, since this can lead to increased oil consumption and eventually to oil leakage from the exhaust manifold, since oil will seep past the turbocharger seals and accompany the induction air into the inlet manifold at low turbo pressure.

One consequence of this is carbon build-up on valves, piston crowns, exhaust ports and the exhaust turbine.

At low loads, the combustion temperature may become so low that complete combustion cannot be ensured, resulting in possible fuel dilution of lubricating oil and eventually leakage from the exhaust manifold.

If the following points are done as a complement to normal maintenance, there will be no risk of malfunctions caused by operation at low load.

- Reduce operation at low load to a minimum. If the engine is regularly test-run without load once a week, the duration of this operation should be limited to 5 minutes.
- Run the engine at full load for about 4 hours once a year. In this way carbon deposits in the engine and exhaust system are given the chance to burn up.

Engine Shutdown

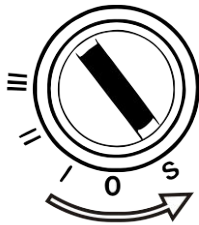
During longer breaks in operation, the engine must be warmed up at least once every two weeks. This prevents corrosion in the engine. If you expect the engine to remain unused for two months or more, it must be laid up: Refer to the chapter *Storage* page 45.

Before Engine Shutdown

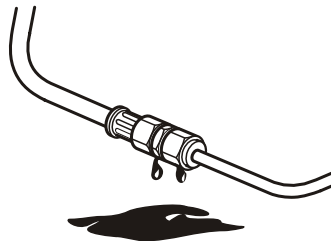
Let the engine run for a few minutes without loading before stopping it. This allows engine temperature equalization and prevents boiling once stopped and also allows the turbocharger to cool down. This contributes to long service life without malfunctions.

Stop the Engine

- Disengage the clutch (if possible).
- Depending on the instrumentation; hold down the stop button until the engine has stopped or turn the key to the stop position. Release the key once the engine has stopped.



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After Engine Shutdown

- Check the engine and engine bay for leakage.
- Turn off the main switches before any long stoppage.
- Carry out maintenance in accordance with the maintenance schedule.

Auxiliary stop

WARNING!

Working with or going close to a running engine is a safety risk. Watch out for rotating components and hot surfaces.

The auxiliary stop (AUX STOP) is located to the right of the steering unit.

NOTICE! The auxiliary stop may under no circumstances be used as the "routine" stop button.

Fault Handling

Fault Tracing

A number of symptoms and possible causes of engine malfunctions are described in the table below. Always contact your Volvo Penta dealer if any problems occur which you cannot solve by yourself.

IMPORTANT!

Read through the instructions for care and maintenance in the *Safety Information page 3* chapter before starting work.

Symptoms and possible causes	
The diagnostics button indicator blinks	Refer to the <i>Diagnostic Function</i> chapter
Engine cannot be stopped	2, 4
Starter motor does not rotate	1, 2, 3, 4, 5, 6, 7, 24
Starter motor rotates slowly	1, 2
Starter motor rotates normally but engine does not start	8, 9, 10, 11
Engine starts but stops again	8, 9, 10, 11, 13
Engine does not reach correct operating speed at full throttle	9, 10, 11, 12, 13, 21, 25, 26
Engine runs unevenly	10, 11, 27
High fuel consumption	12, 13, 15, 25
Black exhaust smoke	12, 13
Blue or white exhaust smoke	14, 15, 22
Lubricating oil pressure too low	16
Coolant temperature too high	17, 18, 19, 20
Coolant temperature too low	20
No charge, or poor charge	2, 23

- 1 Discharged batteries
- 2 Poor contact/open circuit in cables
- 3 Main switch in off position
- 4 Faulty ignition switch
- 5 Faulty main relay
- 6 Faulty starter motor relay
- 7 Faulty starter motor/solenoid
- 8 Lack of fuel:
 - fuel taps closed
 - fuel tank empty/wrong tank connected
- 9 Blocked fuel filter/primary filter (because of contamination, or paraffin fraction separation in fuel at low temperature)
- 10 Air in the fuel system
- 11 Water or contaminants in fuel
- 12 Faulty injection pumps
- 13 Insufficient air supply to engine:
 - blocked air filter
 - air leakage between turbocharger and engine inlet manifold
 - fouled compressor section in turbocharger
 - faulty turbocharger
 - poor engine bay ventilation
- 14 Coolant temperature too high
- 15 Coolant temperature too low
- 16 Oil level too low
- 17 Coolant level too low
- 18 Air in the coolant system
- 19 Faulty circulation pump
- 20 Defective thermostat
- 21 Clogged charge air cooler
- 22 Oil level too high
- 23 Alternator drive belt slipping
- 24 Water entry into engine
- 25 High back pressure in exhaust system
- 26 Break in “Pot+” cable to pedal
- 27 Incorrectly set engine speed regulator/actuator

Diagnostic Function

The diagnostic function monitors and checks that the EDC 4 system functions normally and has the following tasks:

- Discover and localize malfunctions.
- Notify that malfunctions have been discovered.
- Give advice in fault finding.
- Protect the engine and ensure continued operation when serious malfunctions are discovered.

Fault message

If the diagnostic function detects a fault in the EDC 4 system notification is made either through the CAN bus or the diagnostics lamp, which will light up or begin flashing. Simultaneously, the fault will be stored in the control module memory.

Once the fault is remedied and the ignition has been switched off and back on, the fault code goes out. Both rectified (passive) and unrectified (active) faults are stored in the control unit and can be read off by authorized Volvo Penta workshops.

Fault tracing guide

If the diagnostic button is depressed (for 1-3 seconds) and then released, a fault code is flashed out from the diagnostic lamp. The fault code is found in the fault code list, with information about the reason, reaction and measures to be taken. Refer to the *Fault Code Register* chapter.

Effect on the engine

The diagnostic function affects the engine in the following ways: 1. 2.

- 1 The diagnostic function has discovered a minor malfunction which does not damage the engine.
Reaction: The engine is not affected. The diagnostic lamp lights up.
- 2 The diagnostic function has discovered a serious malfunction which makes it impossible to control the engine.
Reaction: The diagnostic lamp flashes. The engine is shut down.

Operation

During starting

When the ignition is turned on, the diagnostics lamp and oil pressure and coolant warning lamp light for two seconds. This is to check the lamp function. If the diagnostic lamp flashes after the two seconds, this indicates a serious fault and the engine can not be started. One or more fault codes can then be flashed out. If the diagnostic lamp is lit, there are one or more less serious faults. One or more fault codes can then be flashed out.

During operation

If the diagnostic lamp starts to flash during operation:

- 1 Reduce engine speed to idle.
- 2 Press the diagnostic button (for 1-3 seconds).
- 3 Release the diagnostic button and make a note of the diagnostic trouble code (DTC) that is flashed out. See "Reading fault codes".
- 4 Look up the fault code in the fault code list and take the necessary measures. Refer to the "Fault codes" chapter. If the diagnostic lamp flashes the engine will shut down.

IMPORTANT!

In VE engines, there is a function in the system which makes it possible to start the engine again and run it for about 25 seconds. This is so that the vehicle can be moved from e.g. a railway crossings.

Reading fault codes

Fault codes can either be read via:

- 1 The VODIA tool (including the Penta EDC4 software). Please refer to the "VODIA User's Guide" for advice on use
- 2 Diagnostic lamp
- 3 CAN

Diagnostic lamp

If the diagnostic lamp is illuminated or flashes, a fault code can be read by pressing the diagnostic button (for 1-3 seconds) and then releasing it. The diagnostic lamp goes out, and a fault code is then flashed out. The fault code consists of three groups of flashes, separated by a pause of two seconds. The first and third group consist of short flashes (0.4 s). The second group consists of long flashes (0.8 s). A fault code is obtained by counting the number of flashes in each group.

Example:

⚡ ⚡ (2 short) pause ⚡⚡ (2 long) pause ⚡ (1 short)
= Fault code 2.2.1 The fault code is stored and can be read off as long as the fault remains. You can find information about cause, reaction and actions in the fault code list. Refer to "Fault codes".

Read off as follows:

- 1 Press the diagnostic button (for 1-3 seconds).
- 2 Release the diagnostic button and make a note of the fault that is flashed out.
- 3 Repeat items 1–2. A new fault code will flash if more faults are stored. Repeat until the first fault code reappears.

NOTICE! When the first fault code reappears, all fault codes have been read off.

When all faults have been rectified:

- 1 Turn the ignition on and off.
- 2 Press the diagnostic button (for 1-3 seconds) to check whether any faults remain.
- 3 If there are no active faults, the diagnostic lamp will give two short flashes, in other cases the remaining non-rectified faults will be flashed out again.

Erasing fault codes

The memory of the diagnostic function is reset when the power to the engine is disconnected. When the power is switched on again the diagnostic function will check if there are any malfunctions in the system. If so a new fault codes is registered.

NOTICE! Power must be disconnected completely.

This means that fault that hasn't been corrected:

- 1 are shown as active, the active fault code can then be erased with the VODIA tool.
- 2 must be acknowledge and read out every time the engine is switched on.

If the diagnostic button is depressed after the fault has been corrected and fault code deleted, the code **1.1, No fault**, will show.

Fault Code Register

This chapter lists the fault codes that may occur. In cases where the operator himself is able to remedy faults easily we refer to the section concerned. In the case of other faults or where a fault remains, contact a Volvo Penta workshop.

The fault codes are listed in numerical order according to their SPN number.

Fault code, engine

	SPN	PID	PPID	SID	PSID	Flash code Electrical fault/Value fault	FMI
Coolant Water Pressure	20	20					
Percent Accelerator Pedal Position	91	91				2.7/- (EMS) 2.8/- (CIU)	9
Fuel delivery pressure <i>Maintenance page 34</i>	94	94				3.6/3.8	1, 3, 5, 7
Water in fuel indicator <i>Draining condensate, fuel system</i>	97	97				2.9/2.1	0, 3, 4
Engine Oil Level <i>Oil level, checking and topping up</i>	98	98				5.9/5.7	1, 3, 4, 5
Engine oil filter diff pressure	99						
Engine Oil Pressure <i>Oil level, checking and topping up</i>	100	100				3.1/6.6	1, 3, 5, 18
Boost pressure	102	102					0, 3, 5, 16
Boost Temperature	105	105				3.2/6.2	0, 4, 5, 16
Boost pressure	106	106				3.4/3.5	0, 3, 5, 16
Air filter pressure	107	107				5.5/5.5	0, 3, 4, 5
Ambient air pressure	108	108				-/-	2, 3, 4
Coolant Temperature <i>Coolant Level, Checking and Topping Up page 39</i>	110	110				3.3/6.1	0, 4, 5, 16
Coolant Level <i>Coolant Level, Checking and Topping Up page 39</i>	111	111				2.3/2.2	1, 3, 5
Crankcase Pressure	153	153				7.8/7.7	0, 2, 3, 5
Battery Voltage <i>Battery, Charging page 44</i>	158	158				-/3.9 (EMS) -/6.9 (CIU)	1, 3, 4
Injection control pressure	164	164				8.3	2, 4, 5
Ambient Air Temperature Sensor	171	171					14
Ambient Air Temperature Sensor	172	172				7.9/-	4, 5
Engine Oil Temperature <i>Oil level, checking and topping up</i>	175	175				3.7/5.8	0, 4, 5, 16
Engine Speed	190	190				-/2.6	0, 16
Throttle position	608		98			-/-	9
Throttle calibrated position	608		132			2.8/-	9
SAE J1708 Data Link	608			250		9.2/-	
SAE J1939 Data Link	608				201		9
+5V sensor supply	620			232		9.3/-	3, 4
Inlet Air Temperature	626	45				5.4/-	3, 4, 5
Program memory	628			240		9.9/-	2, 12

	SPN	PID	PPID	SID	PSID	Flash code Electrical fault/Value fault	FMI
Controller error	629			254		9.9/- (EMS) 9.8/- (CIU)	8, 12
Calibration Memory EEPROM	630			253		9.9/- (EMS) 9.8/- (CIU)	2, 12, 14
Camshaft sensor	636			21		2.5/-	2, 3, 8
Flywheel sensor	637			22		2.4/-	2, 3, 8
SAE J1939 Data Link	639			231		6.5/- (EMS) 6.4/- (CIU)	2
Cooling fan control	647			33			3, 4, 5
Fuel Injector, Cylinder #1	651			1		7.1/-	3, 4, 5, 12
Fuel Injector, Cylinder # 2	652			2		7.2/-	3, 4, 5, 12
Fuel Injector, Cylinder #3	653			3		7.3/-	3, 4, 5, 12
Fuel Injector, Cylinder #4	654			4		7.4/-	3, 4, 5, 12
Fuel Injector, Cylinder #5	655			5		7.5/-	3, 4, 5, 12
Fuel Injector, Cylinder #6	656			6		7.6/-	3, 4, 5, 12
Starter motor relay	677			39		4.6/-	3, 4, 5
Injection Control Pressure Regulator	679				42	8.3/-	3, 4, 5, 6,
Pressure Release Valve	679				97	8.3	0, 7, 11, 14
Starter element	729			70		8.6	3, 4, 5
Stop Input, EMS	970		6			4.8/- (EMS)	4
Fan speed	975	26					3
Compression break	1072		122				1, 3, 4, 5
+5V sensor supply	1079			232		9.3/-	3, 4
+5V sensor supply 2	1080			211		9.3/-	3, 4
ECU temperature	1136		55			8.4	16
Exhaust Temperature	1184	173				4.9/1.9	0, 4, 5, 16
Wastegate Valve	1188			32			3, 4, 5
SAE J1939 Data Link	1231				232		2
SAE J1939 Data Link	1231				229		9
Rail pressure system	1239				96	8.3	0, 1, 4, 7, 12, 16
Engine synchronizing	1377		98				9
Main relay output	1485		5			5.1/-	
Starter Output	1675		3				0, 3, 4, 5, 10
Starter Output	1675			39			0, 3, 4, 5, 10
Data Link	2017				201		9
Internal EGR	2791		19			8.5	3, 4, 5, 7
Starter Output	2898		3				3, 4, 5
Starter Output	2899		3				3, 4
Thermostat bypass valve	2988		332				3, 4, 5
Exhaust gas temperature sensor #1	3241		386				0, 7, 4, 5

	SPN	PID	PPID	SID	PSID	Flash code Electrical fault/Value fault	FMI
Sensor Supply Voltage #1 (+5V DC)	3509			232			3, 4
Sensor Supply Voltage #2 (+5V DC)	3510			211			3, 4
Piston cooling oil pressure	4811		8				1, 2, 3, 5, 18
Piston cooling pressure	520192					6.8/6.7	1, 3
Starter input sensor	520194		4			4.7/- (EMS) 5.2/- (CIU)	
Stop Input, CIU	520195		6			5.3/- (CIU)	4
Frequency select input			113				
Diagnostic request switch input			259				
Oil pressure warning lamp status			260			4.1/-	
Coolant level warning lamp status			261			4.5/-	
Diagnostic lamp status			262				
Run indication lamp status			263			4.3/-	
Over speed indication lamp status			264			4.4/-	
Coolant temperature warning lamp output			7			4.2/-	

Maintenance Schedule

Your Volvo Penta engine and its equipment are designed for high reliability and long life. It is built so as to have minimal environmental impact. If given preventive maintenance, according to the maintenance schedule, and if Volvo Penta original spares are used, these properties are retained and unnecessary malfunctions can be avoided.

CAUTION!

Read the chapter on Maintenance before starting work. It contains instructions on how to carry out maintenance and service operations in a safe and correct manner.

When both operation and calendar time are specified, perform the maintenance job at the interval which is reached first.

Service program

FSI = First Service Inspection

S1, S2, S3 = Special Interval Service

A - F = Type of service (regular service)

C = Clean

R = Replace

A = Adjustment

L = Lubrication

I = Inspection (includes, if necessary, cleaning, adjustment, lubrication and change)

FSI = First Service Inspection

After the first 100-200 hours ⁽¹⁾	
Inspection with VODIA (Diagnostic Tool) ⁽²⁾	I
Fuel pre-filter, draining water / contamination	C
Air Filter	I
Coolant level and antifreeze mixture	I
Drive belts, belt tensioner and idler wheels.	I
Start and warm up engine	
Engine and transmission, abnormal noises	I
Engine and transmission, oil / fuel / water leakage	I

1) Or within 180 days of the date of delivery, or the end of the first season, whichever comes first.

2) Readout if any fault codes and LVD

S1

Every 125-600 hours / at least every 12 month ⁽¹⁾	
Engine Oil and Oil Filters / By-pass filter	R

1) Oil change intervals vary, depending on engine type, oil grade and sulfur content of the fuel. Change the filters during each oil change.

S2

Oil Analysis	
See dealer's information SB 17-0-2	I

S3

After the first 500 hours	
Valve clearance	I

A

Every 500 hours /		At least every (month)		
		12	24	48
Inspection with VODIA (Diagnostic Tool) ⁽¹⁾	I	•		
Fuel pre-filter, draining water / contamination	C	•		
Air Filter	I	•		
Coolant level and antifreeze mixture	I	•		
Drive belts, belt tensioner and idler wheels.	I	•		
Batteries, electrolyte level	I	•		
Start and warm up engine				
Engine and transmission, abnormal noises	I	•		
Engine and transmission, oil / fuel / water leakage	I	•		

1) Readout if any fault codes and LVD

B

Every 1000 hours /		At least every (month)		
		12	24	48
Engine and transmission, inspect hoses and cable clamping	I	•		
Air Filter	R	•		
Fuel pre-filter, filter insert	R	•		
Fuel fine filter	R	•		
Engine and transmission, cleaning/ painting	I	•		

C

Every 1500 hours /		At least every (month)		
		12	24	48
Valve clearance	I			

D

Every 2000 hours /		At least every (month)		
		12	24	48
Turbocharger, inspect / clean as required	I		•	
Drive Belts	R			•
Air Filter, Tank Breather	R		•	
Air Filter, Compressor ⁽¹⁾	R		•	
AdBlue filter ⁽²⁾	R		•	

1) Does not apply to all models.

2) Does not apply to all models.

E

Every 8000 hours /		At least every (month)		
		12	24	48
Coolant VCS (yellow) ⁽¹⁾	R			•

1) Different types of coolant must not be mixed with each other.

Maintenance

This chapter describes the most common maintenance items, see *Service program* for service intervals.

NOTICE! Service points which are not described here must be performed by authorized Volvo Penta workshop.



CAUTION!

Read the chapter on Maintenance before starting work. It contains instructions on how to carry out maintenance and service operations in a safe and correct manner.

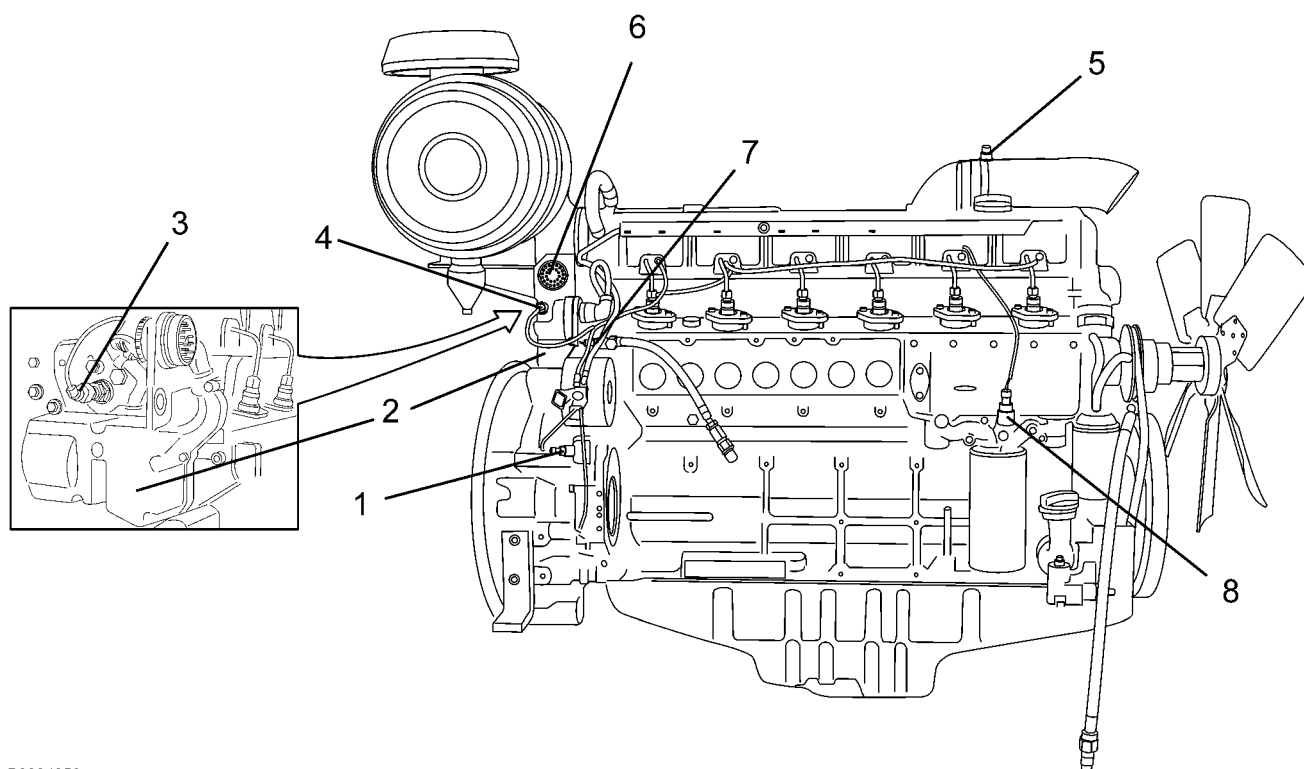


WARNING!

Care and maintenance work should be done with the engine stopped unless otherwise specified. Stop the engine before opening or removing the engine hatch/hood. Make it impossible to start the engine by removing the start key and cutting the system voltage with the main switches.

Read about security measures for maintenance and service in the chapter *Safety Information page 3* before you begin.

Orientation



P0004056

- 1 Engine speed sensor, camshaft
- 2 Engine speed regulator / actuator
- 3 Coolant temperature sensor
- 4 Boost pressure sensor, 3 pin *
- 5 Boost pressure sensor, 4 pin *
- 6 Connection to control unit
- 7 Fuel temperature sensor
- 8 Oil pressure sensor

* Only one type of sensor is used

Engine, General

Air filter, Check / replace

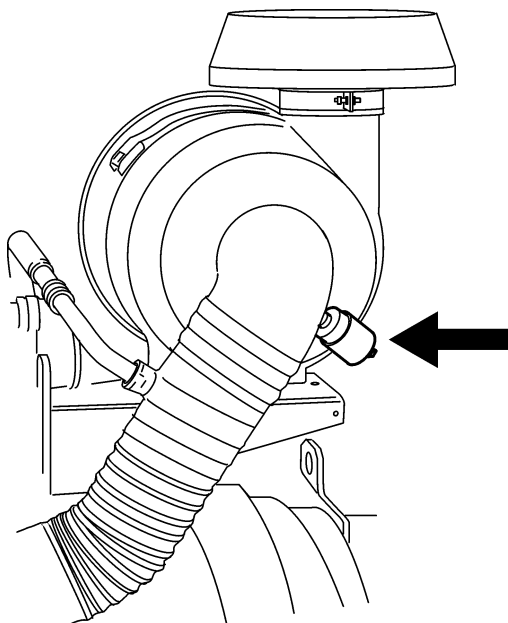
The air filter should be replaced when the indicator remains in the red field when the engine has stopped. Reset the gauge after replacing the indicator by pressing the button.

NOTICE! The filter should not be touched until the indicator displays the red field. Scrap the old filter. Do not clean or reuse.

IMPORTANT!

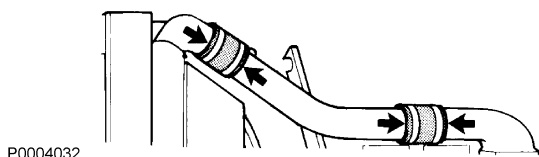
In continuous use the air cleaner should be checked every 8 hours.

When running in extremely dirty environments, coal mines and quarries for example, special air cleaners are required (not available from Volvo Penta).



Charge Air Pipe, Leakage Check

Inspect the condition of the charge air hoses, hose unions and clamp condition for cracks and other damage. Change as necessary.



P0004032

Drive belts, checking and adjusting

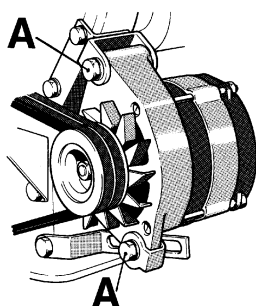
Checks and any adjustments must be carried out after operations, when the belts are hot.

Loosen the bolts (A) before tightening the alternator belts. It must be possible to depress the drive belt about 10 mm between the pulleys. Worn belts working in tandem must be replaced simultaneously.

The belt tensioners on TAD620VE engines have automatic belt tensioners and do not require adjustment.

TD520GE, TAD530/531/532GE, TD720GE, TAD720/721TAD722VE and TAD730/731/732/733GE have mechanical belt tensioners.

Always check belt condition. Check the condition of the drive belts. Replace as necessary.



P0004087



P0002089

Lubrication System

Oil change intervals may vary according to the lubrication oil grade and fuel sulfur content. **Refer to Technical data, Lubrication system.**

NOTICE! Oil change intervals must never exceed a period of 12 months.

If longer oil change intervals than those given in Technical data are required, the condition of the oil must be checked by the oil manufacturer via regular oil tests.

Oil filter, Change

Always follow the recommended oil change interval and always change the oil filter during oil changes. On static engines the drain plug must **not** be removed. Use an oil drain pump to pump the oil out.

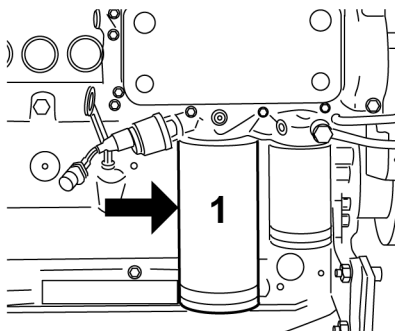
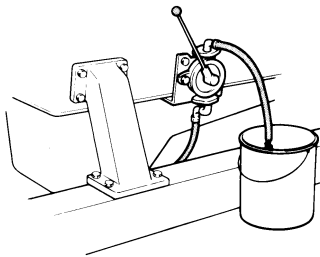
- 1 Clean the oil filter holder thoroughly to avoid dirt entering when new filters are installed.
- 2 Run the engine until warm.

WARNING!

Hot oil and hot surfaces can cause burns.

- 3 Remove the drain plug. Drain the oil.
- 4 Install the drain plug with a new gasket.
- 5 Remove the filter (1). Check that the gaskets do not remain in place on the engine.
- 6 Fill the new the filters with engine oil and brush engine oil on the gaskets. Screw the filters on by hand until the gaskets touch the contact surface. Then turn the filter a further half turn. **Not more.**
- 7 Fill with oil to the correct level. **Do not fill above the MAX level.**
- 8 Start the engine and let it idle. Check that the oil pressure is normal.
- 9 Stop the engine. Check that there is no oil leakage around the filters. Top up with oil as necessary.

Collect the old oil and old filters and hand them to a re-cycling station.

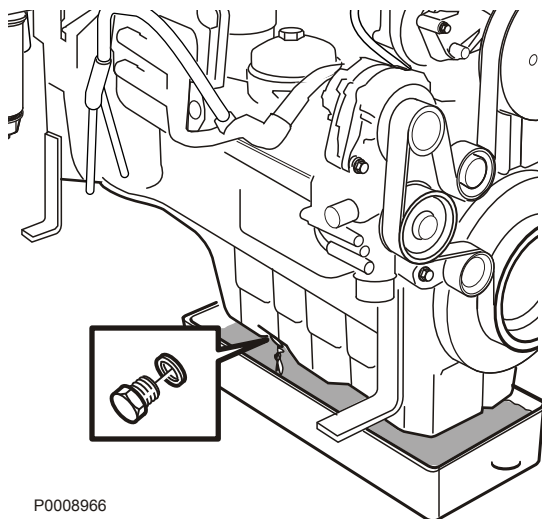


Engine Oil, Change

Always follow the recommended oil change interval and always change the oil filter in connection with oil changes. On static engines the drain plug must **not** be removed. Use an oil drain pump to pump the oil out.

WARNING!

Hot oil and hot surfaces can cause burns.



- 1 Run the engine until warm.
- 2 Remove the drain plug. Drain the oil.

NOTICE! Collect the old oil and old filters and hand them to a re-cycling station.

- 3 Install the drain plug with a new gasket.
- 4 Change the oil filter according to the *Oil filter, Change page 32* instruction.
- 5 Fill oil to the correct level.

NOTICE! Do not fill above the MAX level.

- 6 Start the engine and let it idle. Check that the oil pressure is normal.
- 7 Stop the engine. Check that there is no oil leakage around the filters. Top up with oil as necessary.

Fuel System

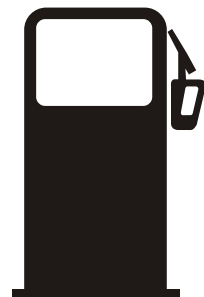
Only use the grades of fuel recommended in the fuel specification. Always observe the greatest cleanliness during re-fueling and work on the fuel system.

All work on the engine injection system must be carried out by an authorized workshop. **If the seal on the injection pump is broken by an unauthorized person, all warranties are void.**

WARNING!

Fire hazard. When carrying out work on the fuel system make sure the engine is cold. A fuel spill onto a hot surface or an electrical component can cause a fire. Store fuel soaked rags so that they can not cause fire.

Store fuel-soaked rags such that they cannot cause a fire.



P0002101

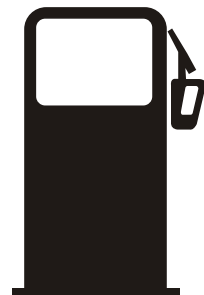
WARNING!

Fire hazard. When carrying out work on the fuel system make sure the engine is cold. A fuel spill onto a hot surface or an electrical component can cause a fire. Store fuel soaked rags so that they can not cause fire.

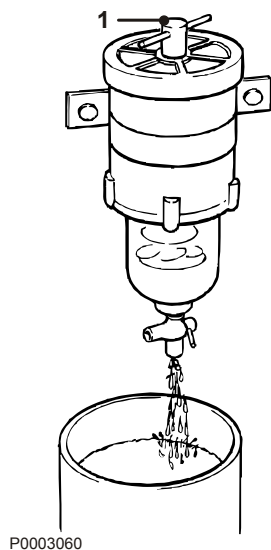
Only use the grades of fuel recommended in the fuel specification below, please refer to *Technical Data, Fuel System*. Always observe the greatest cleanliness during re-fueling and work on the fuel system.

IMPORTANT!

All work on the injection system of the engine must be done by an authorized workshop.



P0002101



Fuel pre-filter

The fuel pre-filter is an optional extra. Position a container under the fuel filter. Drain off water and contaminants using the cock/plug at the bottom.

NOTICE! Fuel pre-filter is standard on 420–733.

IMPORTANT:

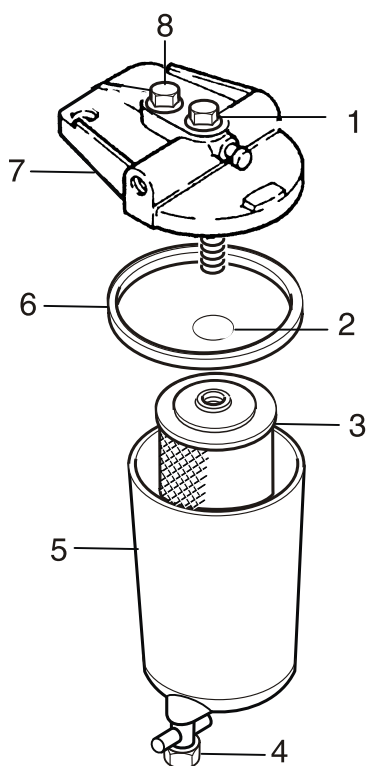
Wait a few hours after the engine has been turned off before draining the filter.

Fuel pre-filter. Filter insert replacement

- 1 Close fuel cock at the fuel tank. Position a container under the fuel filter.
- 2 Unscrew the screw (1) to remove the cover. Replace insert and reinstall cover. Open fuel cock. Bleed fuel system.

NOTICE! Take the old filter to a suitable disposal point.

- 3 Start the engine and check for leaks.



Cleaning fuel pre-filter: (Engines 420–733)

- Close fuel stopcock.
- Place the fuel pan beneath the preliminary fuel filter.
- Remove drain plug (4) and drain off fuel.
- Unscrew clamping screw (1), remove filter housing (5) with filter insert (3).
- Clean sealing surface of the filter bracket (7) and filter insert housing (5) of any dirt.
- Insert new sealing ring (6) and filter insert (3) (change as necessary). – Push the filter insert up to approx. 3 cm over the edge of the housing onto the guide in the filter housing (5).
- Press filter housing (5) with filter insert (3) and sealing ring (6) against the filter console (7) and screw into place with clamping screw 1 (tightening torque 25 Nm).
Note: it must be possible to push the upper seal (2) on filter insert (3) over the guide bracket on filter console (7).
- Tighten drain plug (4).
- Open fuel stopcock.
- Check for leaks after the engine has been started.

Changing

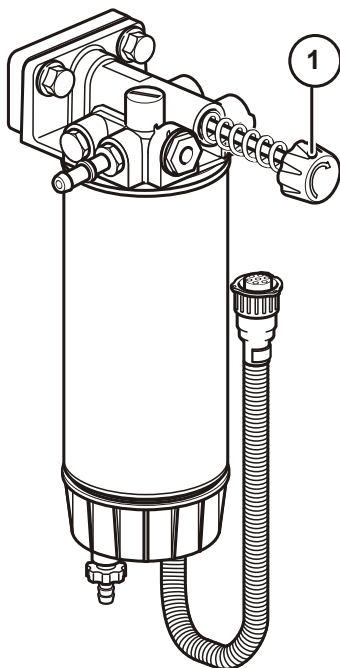
- Replace defective filter insert (3).

Fuel system, bleeding

- 1 Open the hand pump (1), by pressing it in and turning it counter-clockwise.
- 2 Purge the fuel system by pumping at least 250 strokes on the hand pump.
Pump rapidly, to maintain pressure in the pump.

NOTICE! Purging is **not** complete while resistance is felt in the pump.

- 3 Close the hand pump (1) by pressing it in and turning it clockwise.
- 4 Start the engine and let it idle for at least 5 minutes, before speed is increased.



P0003304

Cooling System

The engine's internal cooling system makes sure the engine works at the right temperature. It is a closed system that must always be filled with a mixture of concentrated coolant and water in order to protect the engine against internal corrosion, cavitation and bursting due to freezing.



P0013077

Coolant of a suitable chemical composition must be used all year round. This also applies in areas where there is never any risk of freezing, to provide the engine with full corrosion protection. The use of anti-corrosion agents alone is not permitted in Volvo Penta engines. Never use water alone as a substitute for coolant.

The corrosion protection additives become less effective over time, which means that the coolant must be changed at regular intervals; refer to *Maintenance Schedule*. The cooling system must be flushed whenever the coolant is changed; refer to the *Cooling System, Cleaning page 41* section.

Volvo Penta coolants have been prepared to work best with Volvo Penta engines and offer excellent protection against corrosion, cavitation damage, and bursts due to freezing. Only coolants of this quality are adapted to, and approved by, Volvo Penta.

IMPORTANT!

Volvo Penta engines are delivered with either Volvo Penta Coolant (green) or Volvo Penta Coolant VCS (yellow); both are available as concentrates and Ready Mixed.

We recommend that the coolant supplied with the engine on delivery be used. Future warranty claims related to engine and accessories may be denied if an unsuitable coolant has been used, or if the instructions for coolant mixture have not been followed. Engines using yellow Volvo Penta Coolant VCS must have a yellow decal with the text VOLVO COOLANT VCS on the expansion tank.

- The two types of Volvo Penta coolant may **never** be mixed with each other as this will affect the anti-corrosion properties.
- Coolant filters may not be used together with Volvo Penta Coolant VCS.

Ready Mixed

The ready-mixed coolant protects the engine from corrosion damage, cavitation damage and bursts due to freezing down to

-28 °C (-18 °F) Volvo Penta Coolant (green).

-24 °C (-11 °F) for Volvo Penta Coolant VCS (yellow).

Coolant, Mixing

WARNING!

All coolant is hazardous and harmful to the environment. Do not consume. Coolant is flammable.

IMPORTANT:

Never race the engine when it is cold.

The concentrated coolant must be mixed with pure water (distilled or de-ionized water) according to specifications; refer to *Water Quality* page 52.

Mix: 40% concentrated coolant and 60% water

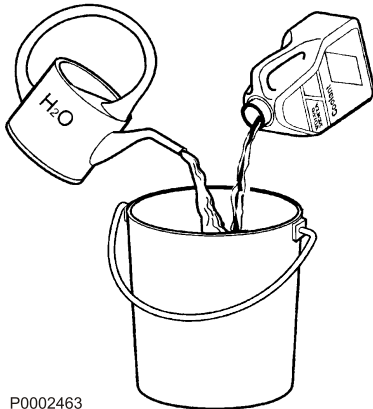
This mixture prevents against internal corrosion, cavitation and bursts due to freezing down to
-28°C (-18°F) Volvo Penta Coolant (green).
-24°C (-11°F) Volvo Penta Coolant VCS (yellow).

At 60% glycol concentration, the freezing point is lowered to

-54°C (-65°F) Volvo Penta Coolant (green).
-46°C (-51°F) Volvo Penta Coolant VCS (yellow).

Never mix in more than 60% of the concentrated coolant. A greater volume of concentrate entails a reduced cooling effect with the risk for overheating and reduced anti-freeze protection.

It is extremely important that the system be filled with the correct coolant concentration. Mix in a separate clean vessel before filling the cooling system. Make sure that the liquids mix.



P0002463

Coolant Level, Checking and Topping Up

WARNING!

Do not open the coolant filler cap when the engine is warm, except in emergencies, this could cause serious personal injury. Steam or hot fluid could spray out.

Check the coolant level daily before starting. Top off with coolant as necessary. The level should be about 5 cm below the sealing plane of the filler cap or between the MIN and MAX markings if a separate expansion tank is installed.

IMPORTANT!

Topping off must take place using a mixture of the same type as that already in the cooling system.

Filling a completely empty system

Check that all drain points are closed.

NOTICE! The location of drain and venting nipples is shown on the next page.

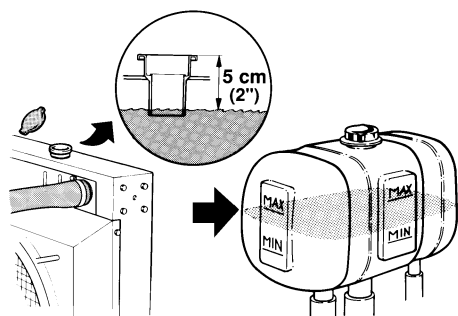
Topping off must be done with the engine stopped. Fill slowly, to allow air to flow out through the venting nipples and the filler.

If a heating unit is connected to the engine cooling system, the heat control valve must be opened and the installation vented during filling.

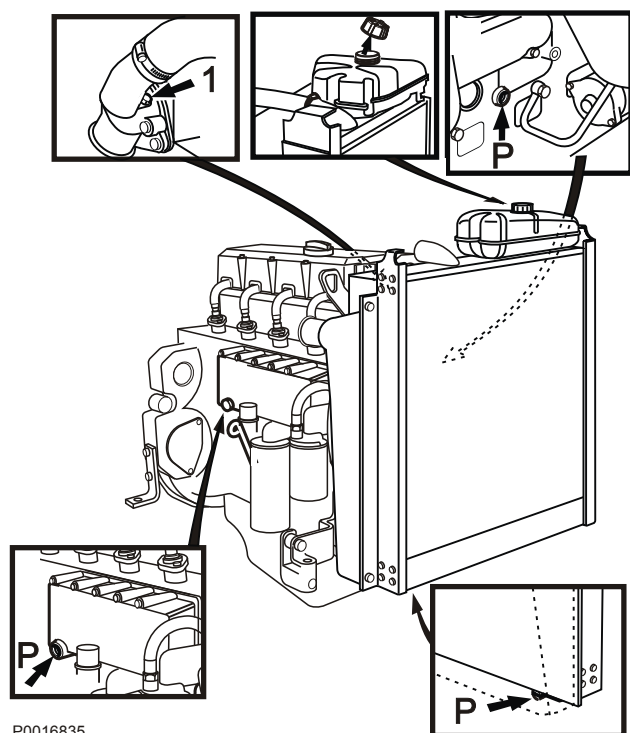
IMPORTANT!

Fill up with coolant to the correct level. Do not start the engine until the system is vented and completely filled.

Start the engine and warm it up until the thermostats are fully open (about 20 minutes). Open any venting nipples a short while after starting, to allow trapped air to escape. Check the coolant level and top up as necessary.



P0004103



Drain/bleed cocks, Location

Drain plugs (P)

- beneath the radiator
- next to cylinder #3 and cylinder 5 (on 4 and 6-cylinder engines)
- beneath the coolant pump (does not apply to 420–733)
- beneath the oil cooler

Venting nipple (1):

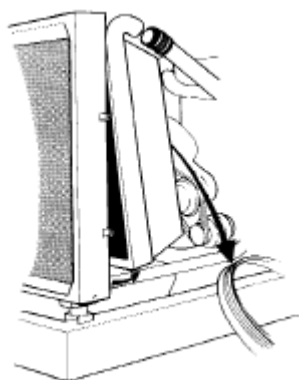
- on the coolant pump

Charge Air Cooler, External Cleaning

Remove guards as necessary, to access the radiator. Clean with water and a mild detergent. Use a soft brush. Be careful not to damage the radiator vanes. Reinstall removed parts.

IMPORTANT!

Do not use a pressure washer.



Cooling System, Cleaning

Cooling performance is reduced by deposits in the radiator and cooling galleries. The cooling system should be cleaned out when the coolant is changed.

IMPORTANT!

Cleaning must not be done if there is any risk of the cooling system freezing, since the cleaning solution does not have any frost prevention ability.

IMPORTANT!

It is extremely important that the correct concentration and volume of coolant is put in the system. Mix in a separate clean vessel before filling the cooling system. Make sure that the liquids mix.

- 1 Empty the cooling system. Refer to *Coolant, Draining*.
- 2 Put a hose into the expansion tank filling hole and flush with clean water, as specified by Volvo Penta—refer to section Water quality in *Technical Data page 51* until the water draining out is completely clear.
- 3 If there should still be some contamination left after flushing for a long time, cleaning can be done with coolant. Otherwise, continue as in item 8 below.
- 4 Fill the cooling system with 15-20 % mixture of concentrated coolant. Use only Volvo Penta recommended concentrated coolant mixed with clean water.
- 5 Drain the coolant after 1-2 days of operation. Remove the filler cap and possibly the lower radiator hose to increase the speed of emptying. To prevent suspended material from settling back in the system, emptying should be done rapidly, within the space of 10 minutes, when the engine has not been standing still for a long time.
- 6 Flush the system immediately and thoroughly with clean hot water to prevent dirt from settling in the inner areas. Flush until the water that runs out is completely clean. Make sure that any heater controls are set to full heating during emptying.
- 7 If contamination should still be left after a long period of flushing, you can do a cleanout with Volvo Penta radiator cleaner, followed by finishing-off with Volvo Penta neutralizer. Carefully follow the instructions on the package. Otherwise, continue as in item 8 below.
- 8 When the cooling system is completely free from contamination, close the drain taps and plugs.
- 9 Fill up with Volvo Penta recommended coolant, following the instructions in the chapters entitled *Maintenance page 37* and *Coolant Level, Checking and Topping Up page 39*.

Electrical System

The engine is equipped with a 2-pole electrical system and an alternator. System voltage is 12V or 24V.

WARNING!

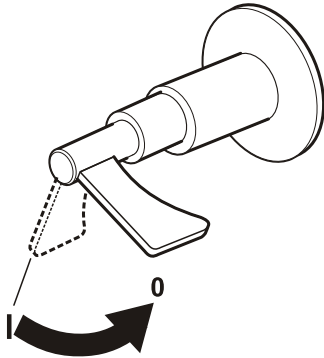
Always stop the engine and break the current using the main switches before working on the engine.

Main switch

IMPORTANT!

Never disconnect the current with the main switches when the engine is running, the alternator and electronics could be damaged.

The main switches must never be switched off before the engine has stopped. If the circuit between the alternator and the battery is disconnected when the engine is running, the alternator and electronics can be damaged. For the same reason the charging circuits must never be re-connected with the engine running.



P0002576



P0016901

Electrical Connections

Check that electrical connections are dry, free from oxide, and that they are securely tightened.



P0002107

Battery, Maintenance

WARNING!

Risk of fire and explosion. Never allow an open flame or electric sparks near the battery or batteries.

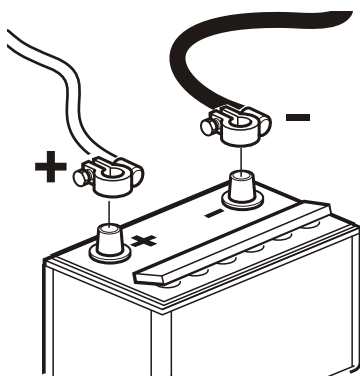
WARNING!

Never confuse the positive and negative poles on the batteries. Risk of arcing and explosion.

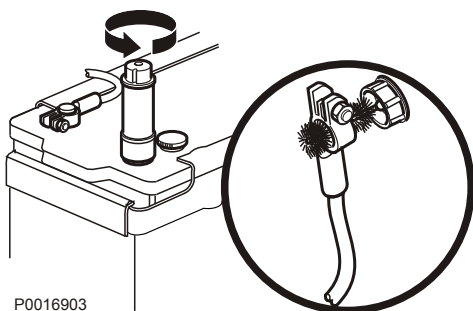
WARNING!

The battery electrolyte contains extremely corrosive sulfuric acid. Protect your skin and clothes when charging or handling batteries.

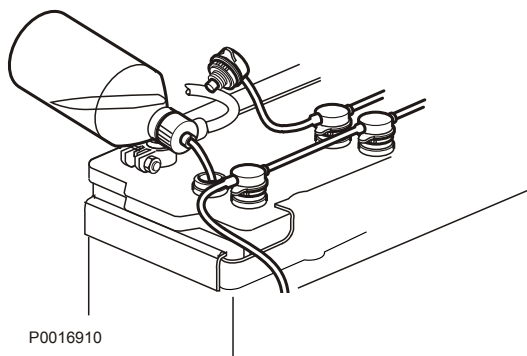
Always use protective goggles and gloves. If battery electrolyte comes into contact with unprotected skin wash off immediately using plenty of water and soap. If battery acid comes in contact with the eyes, flush immediately with plenty of water and obtain medical assistance without delay.



P0016902



P0016903



P0016910

Connecting and disconnecting the battery

Connecting

- 1 Connect the + cable (red) to the + pole on the battery.
- 2 Connect the – cable (black) to the – pole on the battery.

Disconnecting

- 1 Remove the – cable (black).
- 2 Remove the + cable (red).

Cleaning

Keep the batteries clean and dry. Contamination and oxide on the batteries and battery poles can cause stray currents, voltage drop and discharge, especially in wet weather. Remove oxidation from the battery poles and terminals, using a brass brush. Tighten the terminals securely and grease them with terminal grease or petroleum jelly.

Filling

The electrolyte level should be 5–10 mm (0.2– 0.4") above the cell plates in the battery. Top up with distilled water as required.

After filling, the battery should be charged for at least 30 minutes by running the engine at idle.

Some maintenance-free batteries have special instructions, which must be followed.



P0002107

Battery, Charging

⚠ WARNING!

Risk of fire and explosion. Never allow an open flame or electric sparks near the battery or batteries.

⚠ WARNING!

The battery electrolyte contains extremely corrosive sulfuric acid. Protect your skin and clothes when charging or handling batteries.

Always use protective goggles and gloves. If battery electrolyte comes into contact with unprotected skin wash off immediately using plenty of water and soap. If battery acid comes in contact with the eyes, flush immediately with plenty of water and obtain medical assistance without delay.

⚠ WARNING!

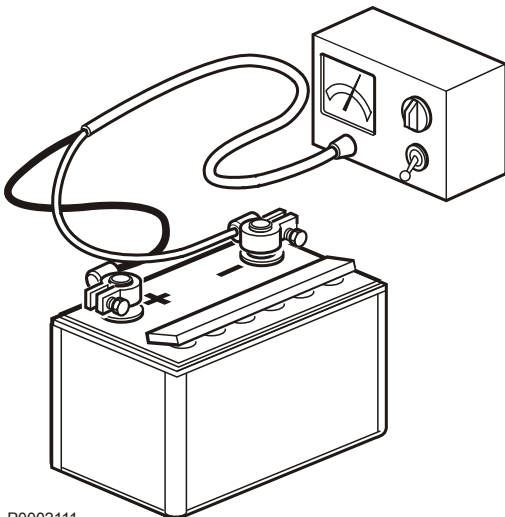
Never confuse the positive and negative poles on the batteries. Risk of arcing and explosion.

IMPORTANT!

Observe the instruction manual for the battery charger carefully. To avoid the risk of electrochemical corrosion when an external charger is connected, the battery cables should be removed from the batteries before the charger is connected.

Always switch off the charging current before the charging clips are removed.

- Charge batteries if they have become discharged. During charging, unscrew the cell plugs but leave them in the plug holes. Ventilate well, especially if the batteries are charged in an enclosed space.
- If the engine is not used for a longer period of time, the batteries should be fully charged, then possibly trickle charged (please refer to the battery manufacturer's recommendations). Batteries are damaged by being left discharged, and can also freeze and burst easier in cold weather.
- Special instructions apply to **boost charging**. Boost charging can shorten battery life, and should therefore be avoided.



P0002111

Storage

The engine and other equipment must be laid up to prevent damage if they are not used for two months or more. It is important that this is done in the correct manner, and nothing is forgotten. For this reason, we have compiled a check list of the most important points.

Before the engine is taken out of service for a long period of time, an authorized Volvo Penta workshop should check it over. Have any faults and deficiencies attended to, so that the equipment is in order, ready for the next start.



CAUTION!

Read the chapter on Maintenance before starting work. It contains instructions on how to carry out maintenance and service operations in a safe and correct manner.



WARNING!

Conservation oils can be flammable and dangerous to breathe. Ensure good ventilation. Use a protective face mask when spraying.

IMPORTANT!

Remember the following when washing with a high pressure washer: Never aim the water jet at seals, rubber hoses or electrical components.



P0002089

- **For up to 8 month's stoppage:**
Change the oil and oil filter on the engine, then warm it up afterwards.
- **More than 8 month's stoppage:**
Conserve the lubrication and fuel systems with conservation oil. Please refer section *Conservation of the lubrication and fuel systems for more than 8 months' stoppage*.
- Check that the coolant offers sufficient frost protection. Top up as necessary.
Alternatively, you can drain the coolant (also drain the coolant filter).
- Drain any water and contamination from the fuel filters and fuel tank. Fill the fuel tank completely, to avoid condensation.
- Disconnect the battery cables, clean and charge the batteries. Trickle charge the batteries while the equipment is in storage. **A poorly charged battery can freeze and burst.**
- Clean the outside of the engine. Do not use a high pressure washer for engine cleaning. Touch up paint damage with Volvo Penta original paint.
- Spray the components of the electrical system with water-repellent spray.
- Check and rust-proof any control cables.
- Put a note on the engine with the date, type of conservation and the conservation oil used.
- Cover over the air filter, exhaust pipe and engine if necessary.

Bringing out of storage

- Remove any covers from the engine, air filter and exhaust pipe.
- Put the correct grade of oil into the engine, if necessary, refer to *Technical Data, Lubrication System*. Install a new oil filter if the filter was not changed during conservation.
- Install new fuel filters and vent the fuel system.
- Check the drive belt(s).
- Check the condition of all rubber hoses, and retighten the hose clamps.
- Close the drain taps and install any drainplugs.
- Check the coolant level. Top up as necessary.
- Connect the fully charged batteries.
- Start the engine and warm it up at fast idle with no loading.
- Check that no oil, fuel or coolant leakage occurs.

Conservation of the lubrication and fuel systems for more than 8 months' stoppage:

- Drain the engine oil and fill up with **conservation oil*** to just over the MIN marking on the dipstick.
- Connect the fuel suction and return hoses to a 1/3 full jerrican containing **conservation oil*** and 2/3 diesel fuel.
- Vent the fuel system.
- Start the engine and run at a fast idle until about 2 liters (0.6 US gals) of the fluid in the jerrican have been used. Stop the engine and connect the ordinary fuel pipes.
- Drain the engine's conservation oil.
- Follow the other instructions on the previous page.

* Conservation oils are sold by oil companies.

Technical Data

Engines

Type designation	TAD620VE	TAD720VE	TAD721VE	TAD722VE
Direction of rotation (seen from flywheel)	Counter-clockwise	Counter-clockwise	Counter-clockwise	Counter-clockwise
No. of cylinders	6	6	6	6
Bore, mm (inch)	98 (3.86")	108 (4.25")	108 (4.25")	108 (4.25")
Stroke, mm (inch)	126 (4.96")	130 (5.12")	130 (5.12")	130 (5.12")
Displacement, liter (inch ³)	5,7 (347.8)	7,15 (436.3)	7,15 (436.3)	7,15 (436.3)
No. of valves	12	12	12	12
Compression ratio, EPA 1	18,4:1	18,4:1	18,4:1	—
Compression ratio, COM 2, EPA2	18,4:1	19,0:1	19,0:1	19,0:1
Firing order	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4
Engine Power, kW (hp)	155 (211)	174 (237)	195 (265)	200 (272)
Max torque, Nm (lbf.ft) at engine rpm	680 (501) 1800 rpm	817 (603) 1800 rpm	897 (661) 1800 rpm	981 (724)
Low idle, rpm	800	800 – 950	800 – 950	800 – 950
Highest full load speed, rpm	2000 – 2500	2000 – 2300	2000 – 2300	2100 – 2300
Weight, dry, kg (lb)	495 (1091)	572 (1261)	572 (1261)	680 (1496)

Type designation	TD520GE	TAD530GE	TAD531GE	TAD532GE
Direction of rotation (seen from flywheel)	Counter-clockwise	Counter-clockwise	Counter-clockwise	Counter-clockwise
No. of cylinders	4	4	4	4
Bore, mm (inch)	108 (4.25")	108 (4.25")	108 (4.25")	108 (4.25")
Stroke, mm (inch)	130 (5.12")	130 (5.12")	130 (5.12")	130 (5.12")
Displacement, liter (inches ³)	4,76 (290)	4,76 (290)	4,76 (290)	4,76 (290)
No. of valves	8	8	8	8
Compression ratio, EPA 1	17,5:1	18,4:1	—	
Compression ratio, EPA2	17,5:1			18,0:1
Compression ratio, EU2		18,0:1	18,0:1	
Firing order	1–3–4–2	1–3–4–2	1–3–4–2	1–3–4–2
Engine Power, kW (hp)	174 (237)	195 (265)	200 (272)	
Engine Power, kW (hp) 1500 rpm	85(116)	89(139)	102(139)	129(139)
Engine Power, kW (hp) A1800 rpm	89(121)	95(150)	110(150)	136(150)
Max torque, Nm (lbf.ft) 1500 rpm	541 (399)	567 (418)	649 (479)	821 (605)
Max torque, Nm (lbf.ft) 1800 rpm	472 (348)	504 (372)	584 (431)	722 (533)
Low idle, rpm	800 – 950	800 – 950	800 – 950	800 – 950
Highest full load speed, rpm	1500/1800	1500 – 1800	1500 – 1800	1500 – 1800
Weight, dry, kg (lb)	550(1213)	575 (1268) ¹⁾	575(1268) ¹⁾	575 (1268) ¹⁾

1) Extra weight TAD530/31/32GE SAE 2 (1800 rpm) 36 kg (80 lbs)

Type designation	TD720GE	TAD730GE	TAD731GE	TAD732GE	TAD733GE
Direction of rotation (seen from flywheel)	Counter-clock- wise	Counter-clock- wise	Counter-clock- wise	Counter-clock- wise	Counter-clock- wise
No. of cylinders	6	6	6	6	6
Bore, mm (inch)	108 (4.25")	108 (4.25")	108 (4.25")	108 (4.25")	108 (4.25")
Stroke, mm (inch)	130 (5.12")	130 (5.12")	130 (5.12")	130 (5.12")	130 (5.12")
Displacement, liter (inch ³)	7,15 (436,3)	7,15 (436,3)	7,15 (436,3)	7,15 (436,3)	7,15 (436,3)
No. of valves	12	12	12	12	12
Compression ratio, EPA 1	17,1:1		17,1:1		
Compression ratio, EPA2	17,1:1	17,1:1	17,1:1	18,0:1	18,0:1
Compression ratio, EU2		18,0:1			
Firing order	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4
Engine Power, kW (hp) 1500 rpm	128 (174)	129(173)	153 (205)	201 (270)	201 (270)
Engine Power, kW (hp) 1800 rpm	134 (180)	136 (182)	163 (219)	225(302)	225(302)
Max vridmoment Nm (lbf.ft) 1500 rpm	815 (601)	821 (606)	974 (718)	1280 (944)	1280 (944)
Max torque, , Nm (lbf.ft) 1800 rpm	711 (524)	722 (533)	865 (638)	1193 (880)	1193 (880)
Low idle, rpm	800 – 950	800 – 950	800 – 950	800 – 950	800 – 950
Highest full load speed, rpm	1500/1800	1500 – 1800	1500 – 1800	1500 – 1800	1500 – 1800
Weight, dry, kg (lb)	750 (1653)	760(1274)	760(1274)	785 (1730)	785 (1730)

Lubrication System

Oil recommendations

Engine	Oil quality ⁽¹⁾	Sulphur content in fuel, by weight		
		<0,5 %	0,5 – 1,0 %	> 1,0 % ⁽²⁾
		Oil change interval, whichever is the sooner in operations		
TAD620VE TD/TAD720–21VE	VDS-3 VDS-2 ⁽⁴⁾	500 hours or 12 months.	250 hours or 12 months.	125 hours or 12 months.
TAD721–22VE TAD731–33GE with open crank case ventilation	ACEA:E7, E5, E3 ⁽³⁾ API:CI-4, CH-4			
TAD721–722VE TAD731–733GE with closed crank case ventilation ⁽³⁾	ACEA:E4 API:CI-4, CH-4 NOTE! Fully synthetic oil must be used			
TAD722VE effekt <200 kW	ACEA:E4	500 hours or 12 months.	250 hours or 12 months.	125 hours or 12 months.
effekt >200 kW		250 hours or 12 months.	125 hours or 12 months.	60 hours or 12 months.

1) Lowest recommended oil grade. Engine oil with higher oil grade is always possible to use.

2) If sulphur content is > 1.0% by weight, use oil with TBN > 15.

3) API: CG-4 or CH-4 are acceptable in markets outside Europe, instead of ACEA E3.

(4) The oil must also comply with at least one of the following specifications: ACEA:E7, ACEA:E5, Global DHD-1, API:CI-4, API:CH-4.

VDS = Volvo Drain Specification

ACEA = Association des Constructeurs Européenne d'Automobiles

API = American Petroleum Institute Global

Global DHD = Global Diesel Heavy Duty

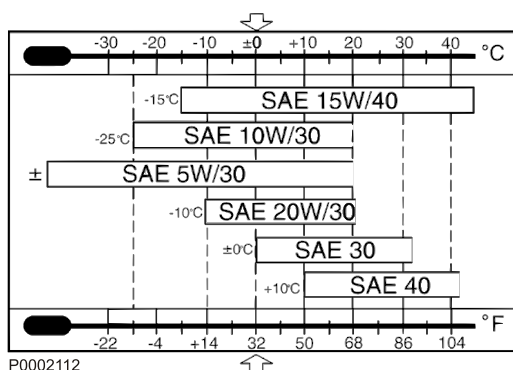
TBN = Total Base Number

Viscosity

Select the viscosity according to the table.

The temperature values refer to stable ambient temperatures.

* SAE 5W/30 refers to synthetic or semi-synthetic oils.



Fuel System

Injection sequence	
TAD530/531/32GE:	1-3-4-2
TAD620VE, TD720GE, TAD720/721/722VE, TAD/30/731/732/733GE:	1-5-3-6-2-4
Feed pump	
Fuel feed pressure	0.5 MPa (72.5 psi)
Fuel feed pressure after fuel filter at 1500 rpm: Min	0.28 MPa (40.6 psi)
Bypass valve	
Opening pressure	360–440 kPa (52.2–63.8 psi)

Biodiesel (FAME)

Biodiesel is also known as fatty acid methyl esters (FAME).

Volvo Penta accepts a max 5% inclusion of FAME in diesel fuel according to EN 590 without affecting service recommendations.

Volvo Penta accepts a FAME inclusion of up to 30% in diesel fuel in engines manufactured after 01/01/2009 under specific conditions and with certain limitations. Specific service requirements for fuel mixtures with more than 5% FAME.

Engines manufactured by Volvo Penta are certified for use with market diesel according to EN 590. Emission requirements according to EU stage 3A are only met using the specified EN 590 diesel fuel. At the time of writing EN 590 diesel fuel may include up to 5% FAME.

Conditions

The above Volvo Penta engines may be run on fuel mixtures with up to 30% FAME under certain conditions.

- Oil grade VDS-3 or VDS-4 must be used.
- FAME must comply with EN 14214 ⁽¹⁾.
- Diesel fuel that is mixed with FAME must comply with EN 590 ⁽²⁾.
- Specific service requirements must be met. Refer to service bulletin 18-8-8, contact your Volvo Penta dealer.

The fuel must comply with national legislation and local regulations concerning the use of FAME. The individual running the engine is responsible for ensuring the use of fuel recommended by the manufacturer and permitted according to national legislation. Ordinary canola oil and other pure vegetable and animal oils do not comply with EN 14214 and may not be used as fuel or a fuel additive. These products are not approved by Volvo Penta and the warranty will not cover any engine damage.

Performance

FAME has a lower energy value than standard diesel. The use of 30% FAME may lead to an increase in fuel consumption of up to 5% and a reduction in maximum power of up to 4%. The engine's fuel consumption data only applies to diesel and values will be incorrect if FAME mixtures are used. Predictive maintenance for oil drainage does not apply. Exhaust gases may smell differently and smoke may occur at start when FAME is used.

1) European standard that describes quality requirements and test methods for FAME.

2) European standard that describes quality requirements and test methods for diesel.

Cooling System

Type	
Pressure cap, max. opening pressure:	
TAD530/531GE, TAD520VE, TAD620VE, TAD720/721/722VE, TAD732GE, TAD733GE:	90 kPa (13 psi) ⁽¹⁾
TAD532GE, TD720GE, TAD730GE, TAD731GE:	60 kPa (8.7 psi)

1) 1) Applies to VE engines that are not equipped with a factory-fitted pressure cap.

Volume (engine)	
TAD620VE:	6 liter (1.58 US gal)
TD520GE, TAD530/531GE:	7,2 liter (1.9 US gal)
TD720GE, TAD720/721/722VE, TAD730/731/732/733GE:	9,8 liter (2.59 US gal)
Volume (engine + radiator and hoses)	
TD520GE:	17,5 liter (4.62 US gal)
TAD530/531GE:	19,7 liter (5.2 US gal)
TD720GE:	22 liter (5.8 US gal)
TAD532GE, TAD730/731GE:	23,8 liter (6.3 US gal)
TAD732GE/TAD733GE:	27,3 liter (7.2 US gal)

Thermostat	
Quantity and type	1 pc piston thermostat
Opening temperature	
TAD620VE, TD520GE, TAD530/531/532GE, TD720GE, TAD730/731GE:	83° C (181° F)
TAD720/721/722VE, TAD732/733GE:	87° C (189° F)
Fully open at	
TD520GE, TAD620VE, TAD530/531/532GE, TD720GE, TAD730/731GE:	95° C (203° F)
TAD720/721/722VE, TAD732/733GE:	102° C (216° F)
Coolant Filter	
Qty	1

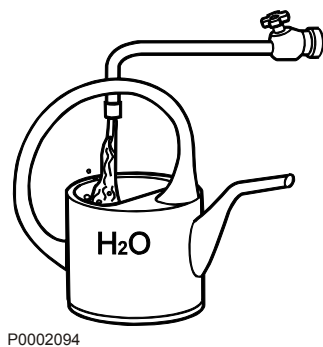


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Coolant

Volvo Penta Coolant VCS and VCS Ready Mixed (yellow colour) are based on Organic Acid Technology, OAT.

Volvo Penta Coolant and Coolant Ready Mixed (green colour) are silicate based.



Water Quality

ASTM D4985:

Total solid particles	<340 ppm
Total hardness	<9,5° dH
Chloride	<40 ppm
Sulfate	<100 ppm
pH value	5.5–9
Silica (acc. ASTM D859)	<20 mg SiO ₂ /l
Iron (acc. ASTM D1068)	<0.10 ppm
Manganese (acc. ASTM D858)	<0.05 ppm
Conductivity (acc. ASTM D1125)	<500 µS/cm
Organic content, COD _{Mn} (acc. ISO8467)	<15 mg KMnO ₄ /l

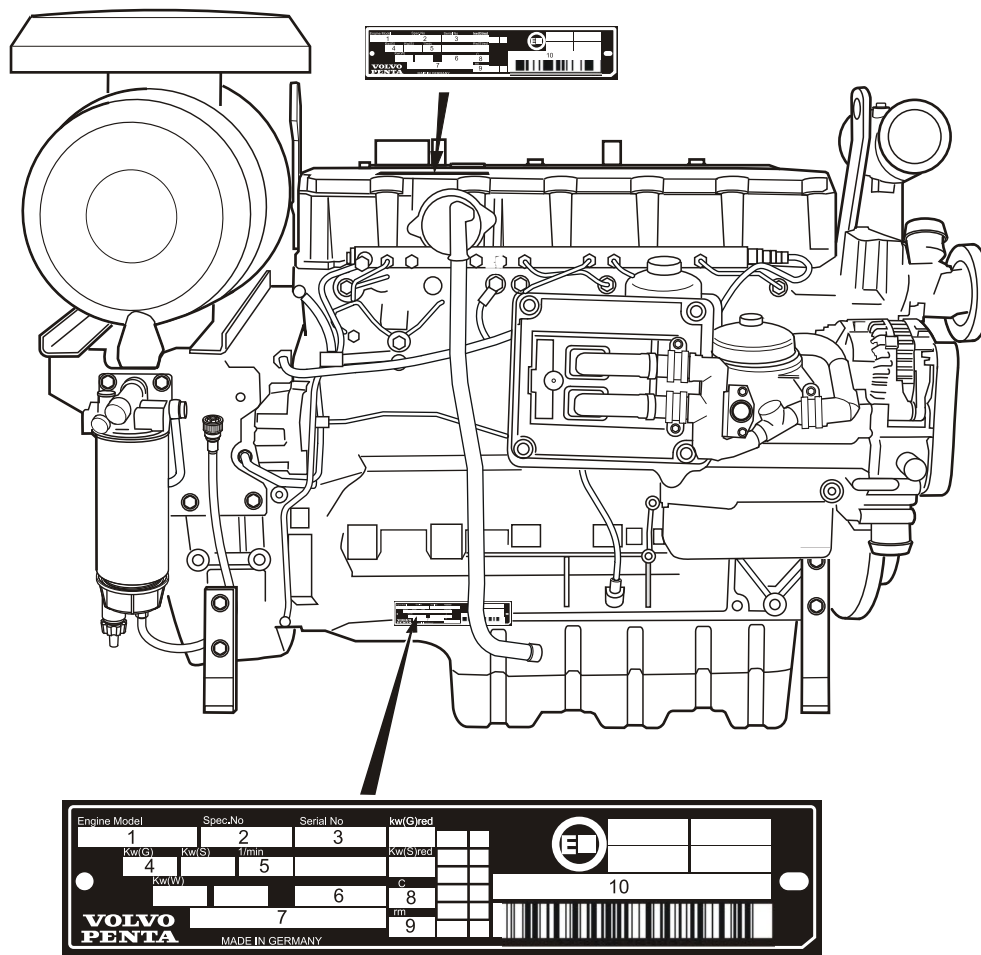
Electrical System

System voltage	24 V (standard), 12 V (option)
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Identification Numbers

Location of engine plates (early model)

The engines are supplied with two engine plates, of which one is installed on the right side of the cylinder block and the other on top of the valve cover.

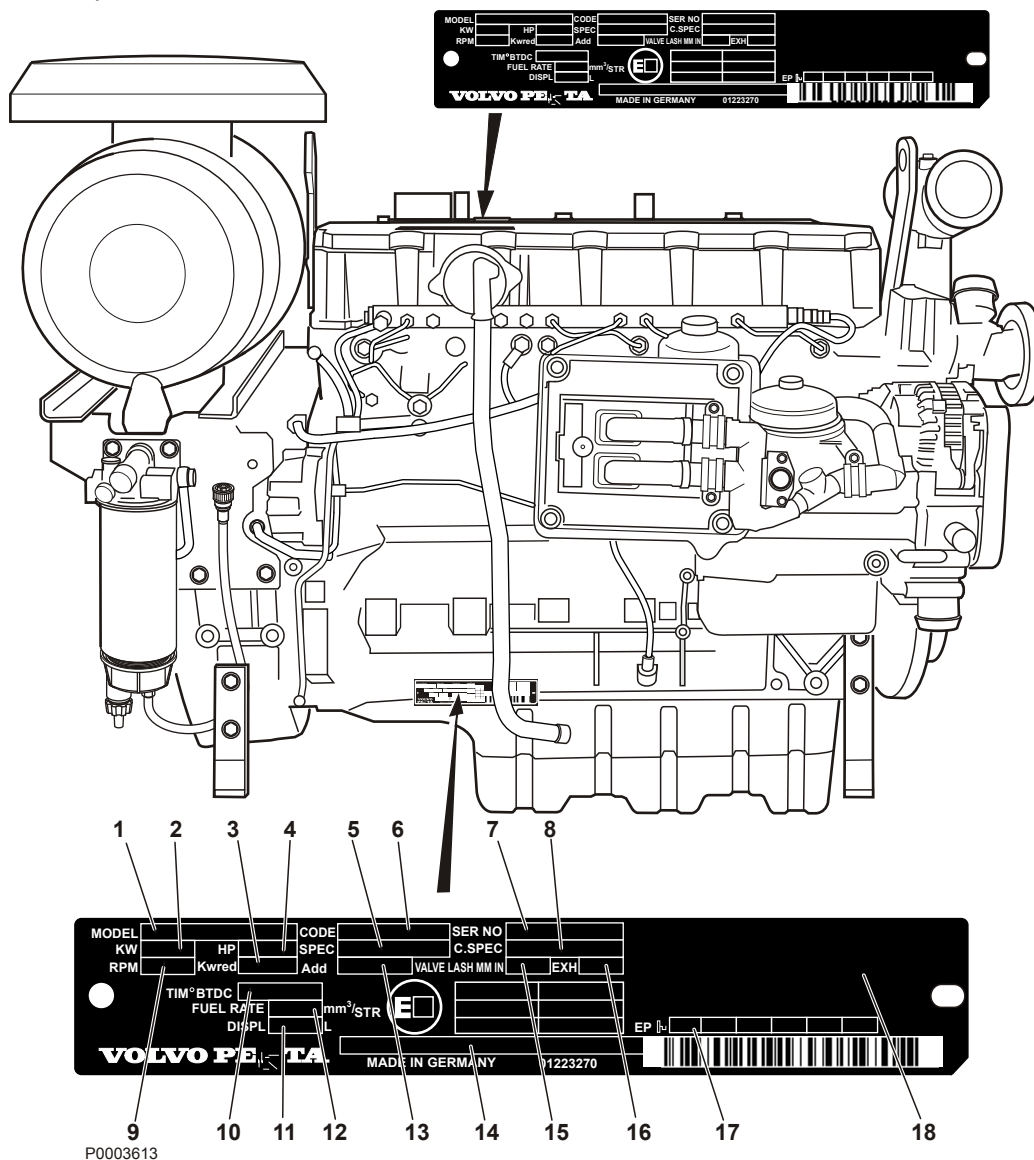


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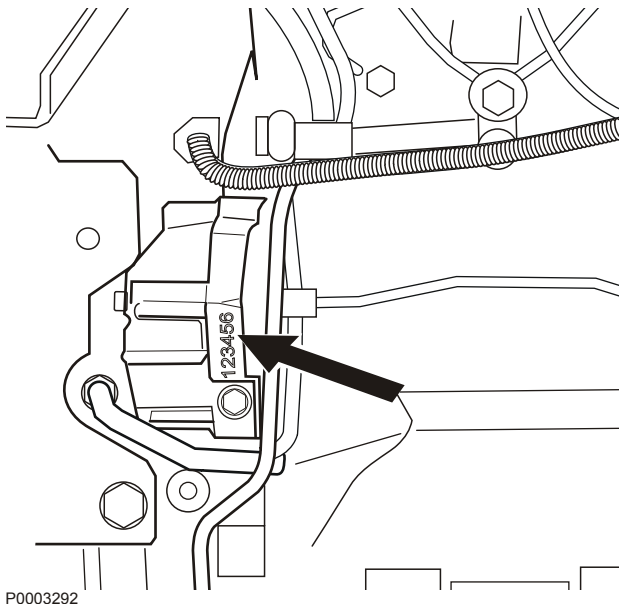
- 1 Engine model
- 2 Engine specification number
- 3 Engine serial number (10 digit)
- 4 Engine power, peak, without fan
- 5 Engine rpm
- 6 Engine code (linked to EPA/EU Tier III approval)
- 7 Rated power, standard (peak power according to Tier III)
- 8 Air temperature in °C (°F), in accordance with ISO 3046
- 9 Altitude above mean sea level, in accordance with ISO 3046
- 10 EU Tier III, approval number

Location of engine plates (late model)

The engines are supplied with two engine plates, of which one is installed on the right side of the cylinder block and the other on top of the valve cover.



- | | |
|-----------------------------------|--|
| 1 Engine model | 10 Injection angle and camshaft type |
| 2 Engine power, without fan (kW) | 11 Cylinder volume, total |
| 3 Not used | 12 Injection volume |
| 4 Engine power, without fan (hp) | 13 Not used |
| 5 Not used | 14 Certification approval number |
| 6 Manufacturer's ID code | 15 Valve clearance, inlet valve (mm³/stroke) |
| 7 Engine serial number (10 digit) | 16 Valve clearance, exhaust valve (mm³/slag) |
| 8 Engine specification number | 17 EP code for injection pump (cyl. 1 first) |
| 9 Engine rpm | 18 Further information |



Engine serial number

The engine serial number is stamped on the engine block and on the product plate. The serial number consists of 10 digits. Only the last eight digits are stamped on the engine block.

Engine data (refer to engine plate below)

Engine model (1):

Specification number (2):

Serial number (3):

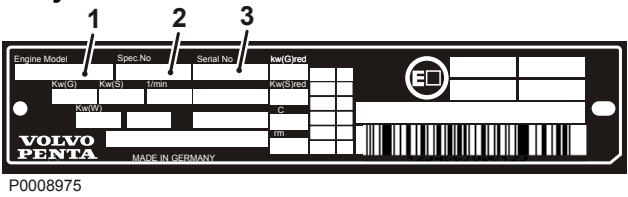
Nearest Volvo Penta workshop

Name:

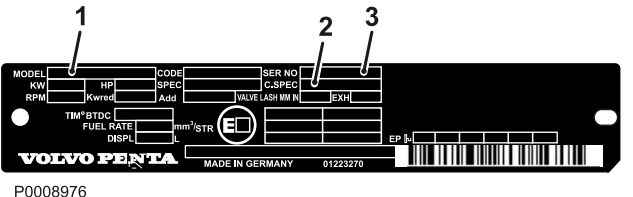
Address:

Telephone:

Early model



Late model



VOLVO PENTA

Declaration for the installation of partially-completed machinery in accordance with Machinery Directive 2006/42/EC

Engine Manufacturer:

AB Volvo Penta
Gropegårdsgatan
SE 405 08 Göteborg
Sweden

Description of engine: 4-cycle diesel engine

Engine types covered by this declaration:

TD520GE
TAD530GE
TAD531GE
TAD532GE

TD720GE
TAD720GE
TAD730GE
TAD731GE
TAD732GE
TAD733GE

TAD620VE
TAD720VE
TAD721VE
TAD722VE

Fundamental health and safety requirements applied to, and fulfilled by, the above-mentioned engines are described in the following items in Annex I; 1.4.2, 1.6.1, 1.6.2, 1.6.4, 1.7.1, 1.7.1.1, 1.7.1.2, 1.7.4, 1.7.4.1, 1.7.4.3.

The relevant technical documentation is compiled as described in part B of Annex VII.

Relevant information concerning the partially-completed machinery will be provided in suitable form upon justified requests from competent national authorities. The individual authorized to compile the relevant technical documentation is the signer of this declaration.

The partially-completed machinery also complies with the following relevant Directive:

2004/108/EC - Electromagnetic Compatibility (EMC) Directive

Applied Standards: EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 12895, EN-ISO 14982 and EN 13309

These engines may not be put into operation before the completed machinery into which they are to be installed has been declared to conform with the provisions of Machinery Directive 2006/42/EC.

Name and function: Tom Tveitan, Laws and Regulation

(the identity of the individual authorized to sign on behalf of the engine manufacturer or the latter's authorized representative).

Signature and title:



Date and place of issue: (yyyy/mm/dd) 2011/02/17 Gothenburg

PL-20/11

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AB Volvo Penta

SE-405 08 Göteborg, Sweden

www.volvopenta.com